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Cognition Regulated by Emotional Decision Making

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Cognitive ability did not appear *de novo* in humans. Despite our ability to recognize limited cognitive behavioral characteristics in animals, there has been no outcry to proclaim this phenomenon. The notion that humans are the only animals to possess cognition has taken advantage of the illusory potential in inter-subjectivity and placed him outside of reality. This deception, however, has positive survival value due to the fact that it is humankind's self-proclaimed responsibility to excel beyond other simple animal species. However, at this point in evolution, we must allow our cognitive ability to reform itself and, in so doing, evolve with the benefit of the knowledge that this ability is itself creating. By recognizing that animals may have limited cognitive ability, we only enhance our self-esteem, not diminish it. Furthermore, cognition, given its limited brain controlling attributes, may mask another more diligent force for action and control, namely, emotion. Emotion provides the motivation for action, the mechanism to limit reason in a timely survival related manner and a coping strategy for dealing with other humans and animals while simultaneously modulating involuntary physiological functions in an appropriate manner.

MeSH Keywords: **Bonding, Human-Pet • Cognition • Dogs • Emotions • Oxytocin**

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Background

Previously, we hypothesized that the development of cognitive processes provided such endowed animals with an additional coping strategy in dealing with stress [1]. This ability depends on a unifying consciousness appearing to control or regulate the many individual processes that potentially summate to make up the mind. Without this unifying component, the significance and uniqueness of this coping strategy would be lost. The cognitive mind would also have to develop, by chance within certain contingencies, a strong biological bias leading to belief in a highly organized world, since this is what would have survival value within one lifetime. In this regard, intersubjectivity and not objectivity is the best one can aspire to as a cognitive being. As Hundert (1989) has clarified, there is always, in every appraisal we make, a contribution of 'thoughts to things,' which necessarily introduces an illusory potential. As also noted, there is a contribution of 'things to thoughts' [2]. The intersubjective world is not only shaped by our brains, but this very world also plays a role in shaping them. So to some extent, our 'brains' are organized in concert with the world around us. Theoretically, our brains would develop differently if they were shaped by existence on another planet. Nevertheless, one can surmise that a potential illusory contribution of 'thoughts to things' is the human cognitive appraisal of a highly organized, objectifiable, understandable universe. Thus, this sense of unity as a coping strategy is somewhat of a deception or illusion, in that it imposes perceived order. Therefore, the biology of deception has been an important evolution leading to humans as creative cognitive beings [1].

Another premise extends this notion and suggests that denial-like processes are at the core of the cognitive coping mechanisms we have evolved as humans [1,3,4]. In this regard, with cognitive ability, one associates or assumes that this process occurs by way of a 'rational' mind. That is the ability to evaluate many items of information and finally, come up with a well-thought-out solution to a problem. As is implied, this only occurs after a conflict, with weighing out of all details, considerations, and facts in a situation. However, such a detailed cognitive process as being rational would also lead, counter-intuitively, to inactivity and major delays in conclusion-reaching. Thus, for many circumstances an organism exhibiting extended 'rationality' would not or could not survive. From this premise, we surmised that, in part, emotion can be viewed as prompting a short-cut to 'rational' decision-making [3]. Thus, our perceived rationality may also be a deceptive behavioral response. In reality, our quick decision-making ability, certainly when resulting behavior is largely a product of pre-cognitive functioning, has fewer overt parameters and occurs rapidly.

In the present report, we surmise that humans as cognitive beings did not just 'appear' upon the top of the evolutionary tree

with cognitive ability. In this regard, we will not extensively review the recent and impressive reports that other animals may have a level of consciousness and limited intelligence [5–10]. Instead, we will provide a logical argument for the apparent reluctance of humans, in general, to accept these behavioral attributes as being present in other animals. Indeed, this reluctance may be founded once more in the overall concept of the biology of deception; that is a perceived distortion of reality that favors survival and a sense of superiority.

Discussion

Evolution

It is widely held that the mammalian nervous system had its origin in invertebrate organisms. Indeed, when we examine the fundamental basis of any stimulus response mechanism, even in a single cell, we are left with astounding simplicity, i.e., there are only sensory, integrative and motor components in this loop. Presumably, during evolution, making this system work in an appropriate fashion must have taken an equally long time in itself. However, once established, the blueprint remains. Moreover, once the energy-saving advantage of having cells communicate and develop specialized activities was realized, another conservative mechanism became evident. Cells were communicating, to a great extent, by chemical means, since this method of signaling reduces the size requirements for the individual communicating components (signal molecule and its corresponding receptor). This method of intra- and intercellular communication allowed for a greater level of sophistication and information transfer compared to a scenario of whole cells touching, using up limited space. It also allowed for distant signaling within an organism. The significance of stereoselective chemical communication can be noted today by its presence and actions in diverse organisms. Similarly, many of the same intracellular and intercellular signal molecules have been retained during evolution as well as functions associated with them first found in organisms considered primitive [11–14]. This is manifest, for example, in signal molecules once associated exclusively with the nervous system now being demonstrated in the immune system, and vice versa, e.g., neuropeptides and cytokines, respectively [14]. If we now examine what has evolved to account for human cognitive ability, it would have to be the extent and capacity of the integrative processes.

In examining any text in comparative anatomy, we are also led to the conclusion that a single structure can be traced back in time and that its presence today has been modified. The examples of this development process that retains and embellishes information as a function of a changing environment with time are now too numerous to list.

Perceptions

Since this developmental process of using and modifying existing structures and their activities is ongoing, we are on strong ground in surmising that the same holds true for a host of behaviors, including cognitive ability as noted to be present in animals other than humans by various authors [5–10,15], i.e. animals probably have a limited degree of cognitive ability, displaying critical fragments of the capability that exists more fully in humans. It would be foolish to think that this is the first process that developed fully *de novo* in humans. This assumption is fully borne out in recent reports concerning animals exhibiting higher behavioral characteristics, i.e. limited cognition.

Since this appears to be a logical assumption regarding the developmental aspects of cognitive ability during evolution, we are faced with the question of why there is such reluctance to recognize limited cognitive ability for what it is in other animals? In part, we speculate that this concept has not gained wide acceptance because humans, deceptively, perceive themselves not only as being at the top of the evolutionary tree, but the responsible agents for all other life forms as well, because they are not so endowed. Thus, by denying their limited capacity for complex 'inner' behavior, we further exalt ourselves. By placing ourselves on such a high level, we further advance our self-image. This in turn has allowed humans to excel, since humans believe they alone are capable of such higher neural activities. Indeed, it is humans who provide the 'rhyme and reason' for all events given the responsibility of their position. Thus, this false belief can be viewed as a successful strategy ensuring survival. This belief can and has been used to place the desires of humans over that of other living forms, which actually may not be tolerated for such a trait. Progress as a species is assured by this coping strategy since humans alone are the master of all other life forms by being singly possessed with cognitive ability. Moreover, believing we are supreme helped us throughout our history in explaining our position on the planet and in the universe.

Viewing this from a negative perspective, it would have been difficult to make decisions of survival based on the killing of other cognitive beings, regardless of how limited their abilities in this regard may be. Furthermore, recognizing this ability in other animals would have placed limitations on human actions throughout history.

In the past, our laboratory, from its perspective, noted that cognition evolved as a coping strategy. This strategy gave survival value to the evolution of a mind capable of purposefully interacting with the environment and building and using information in the novel, e.g., creative endeavors. However, for the mind of an individual to "advance" (succeed), each had to have the illusion of being both right and superior in its outcome

otherwise the mind's motivation would not be present, leading to inactivity since competitive thinking would not exist. Additionally, if our brain-based cognitive activities were to be truly rational, each thought would require a thorough reasoning process; again, this would be time-consuming, leading to inactivity. Clearly, cognition carries a negative component with its evolution, namely, superiority and the belief that the individual barrier of the unit cognitive process is always right, imposing their will to induce their conformity.

In this regard, cognition required the opposite neural process of rationality to achieve rapid and creative advances. Cognition's shortcut, emotion, became that safety factor, offering a way out of long cognitive exercises, as well as justifying novel solutions (on the spot, gut feelings, etc.) [3]. While some may be coupled emotionally to motivating behaviors, e.g., rage, sex, pain, etc., it has greater regulatory features that exceed cognition, e.g., unconscious regulatory activities (vasomotor modulation, involuntary responses, etc.). By placing involuntary functions under its sphere of physiological influence, one may surmise emotion regulates more functions, which are also occurring simultaneously, than those under the control of cognition. Emotion thus becomes the most dominant physiological process in the brain and occupies a central regulatory position in cognition, allowing it to advance in its creative potential.

Briefly, validation of the hypothesis, the significance of emotion, comes from animals that have 'chosen' to be our companions, in some cases by preferentially selecting us over their species, e.g., dogs. In general, these animals do not compete with us for intellectual superiority, which would be difficult to allow given our desire for conformity and our minds' construct for not tolerating cognitive competition, but would be easy for them to attain emotional ties, which would make the coupling more pleasant while maintaining the superiority component of the interaction. Thus, over time, 'commandeering' a foothold in our cognitive mind would be more easily facilitated by way of creating an emotional dependence for them. It would represent the ideal mechanism for ensuring their position as our loyal companions since this event would represent all anthropomorphic manifestations as being human-friendly and supportive.

In recent years, our understanding of animal behavior, such as with dogs, has grown in depth so that associations can be made between their cognitive level and their interaction with humans. In this regard, this understanding also includes the demonstration of neural substrate commonalities. The presence of the bonding chemical messenger, oxytocin, in dogs helps explain why deeply imbedded associations in bonding occur between us since they secrete this molecule during bonding, e.g., gazing [16–20] (Figure 1). These phenomena also have been associated with a dog's ability to 'commandeer' human emotions, making them desirable and 'sympathetic' social



Figure 1. The Emotionally Charged “Gaze”, facilitating bonding, followed by a plethora of emotional interpretations.

partners [21]. This level of unconscious communication is based on the assumption that dogs have an inherent ability to build on the evaluation of a human’s emotions, using this ability in a unique survival coping strategy [21,22]. Hence, a good part of canine survival occurs because emotions exist in both species, allowing these organisms, especially humans, to interact on the emotional level. For humans, the weight of rationality is, in part, removed because emotion represents a short cut to the lengthy process of rationality as noted earlier [3].

Conclusions

Despite our ability to recognize limited cognitive behavioral characteristics in animals, there has been no outcry to proclaim

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this phenomenon. The image we have of ourselves as solely possessing cognition has taken advantage of the illusory potential in intersubjectivity and has placed us outside of reality. This deception, however, has positive survival value since it is humankind’s self-proclaimed responsibility to excel beyond other simple animal species. However, at this point in evolution, we must allow our cognitive ability to reform itself, and in so doing evolve with the benefit of the knowledge that this ability is itself creating. We propose that emotional systems play a large role in modulating mind and body related functions that previously realized themselves in cognitive endowments. Emotion induces by its nature many neural regulating processes out of the cognitive sphere of control. How else can the total mind-body phenomena be modulated? Interestingly, animals, such as dogs, have tapped into this unconscious integrative control system by appealing to emotional modulation via similar neural anatomy and physiological systems, making themselves a necessity for the human experience. In so doing, they have measurably enhanced the quality of cognitive life, including providing health benefits via emotional bonding. What an unexpected gift for a creature driven by superiority.

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