



## The mis-exaptation of the prediction capability of humans and emergence of intolerant religious beliefs



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### ABSTRACT

Some neurobiological aspects and social consequences of religious beliefs are briefly discussed. A basic aspect to be considered is the capability of several living beings to prospect future scenarios. In this context, however, it has to be underlined that only humans know that they have to die. Consequently, all human cultures have proposed dreams, visions and religious beliefs to dispel the fear of death. Awareness of the end of life has played a fundamental role in the emergence of religious beliefs.

The social aspects of religions will be considered from Bloch's perspective that modern humans are the only living beings capable of peculiar social inter-relationships, namely the transcendental social, which consists of the creation of essentialized roles and groups that exist separately from the individual who holds them. In other words, the transcendental social bonds not only real groups, such as tribes, clans or nations, but also imaginary groups, such as ancestors or gods, thereby allowing the emergence of religion as a uniquely human activity. In the present paper, it is suggested that the concept of exaptation can shed some light on the origin of religions and on their potential positive effects on individual lives and human societies. On the other hand, the concept of mis-exaptation can shed some light on the possible perverse side-effects of religious beliefs. Thus, some aspects of the possible conceptual and neurobiological links between exaptation and mis-exaptation of the religious beliefs will be analyzed.

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## 1. Introduction: general premises

In an interesting paper, Bloch (Bloch, 2008) suggested that the “transactional social” should be distinguished from the “transcendental social”. The former refers to roles and groups that are the product of a process of continual manipulation, assertions and defeats among individuals. This type of social is found not only in modern humans but also in other species, e.g., in chimpanzees. By contrast, the transcendental social, which is found only in modern humans, consists of essentialized roles and groups that exist separately from the individual who holds them.

Religion is a uniquely human activity, and is not observed in other animal species. Religions are deeply rooted in the human capability of the transcendental social, which bonds not only real groups, such as tribes, clans or nations, but also imaginary groups, such as ancestors or gods. Hence, the transcendental social allows concrete meanings to be assigned to constructs provided by imagination. Furthermore, in Bloch's view, the transcendental social compels humans to follow idealized codes of conduct; hence, religious beliefs also have a profound impact on transactional social interactions.

Many human faculties are involved in religious beliefs. An important aspect to be underlined is that humans are the only living beings that know that they have to die. As a consequence, all cultures have proposed dreams, visions and religious beliefs to dispel the fear of death.<sup>1</sup> However, although this is certainly an important reason why human beings embrace religion, individual subjects generally accept a religious belief as a consequence of the cultural tradition in which they have grown up. Such acceptance is usually acritical and, being irrational, can have devastating effects on inter-human group relations. Indeed, history has amply documented the devastating effects produced by groups of human beings belonging to exclusive monotheistic religions, since such beliefs have had and, in most cases, still have an essential feature of intolerance<sup>2</sup> (see Section 3).

Against this background, an acute problem for mankind is the establishment of a hopeful rational agreement among religious beliefs to reach inter-religious tolerance, which is vital to global social progress. The difficulties of this fundamental process were analyzed by Dennett in his fascinating and well-documented book “Breaking the Spell” (2006). Dennett proposed a Darwinian approach to the origins of religion, like those suggested for investigating the origins and social meanings of languages and music. This Darwinian perspective could be an important starting point from which to develop rational approaches to inter-religious tolerance.

Thus, in the hope of Dennett, such investigations could lead to the tempering of current religious extremism by explaining cultural backgrounds to the new generations, which should make bloody religious conflict impossible.

Dennett's evolutionary approach is an important contribution and his approach has been substantially followed in the present paper. Indeed, in the context of an evolutionary perspective, it is

suggested that Gould and Vrba's concept of exaptation (1982) and that of mis-exaptation (Agnati, Barlow et al., 2012) can clarify some by-products of religious beliefs.

Specifically, the concept of exaptation can shed some light not only on the origin of religions but also on their potential positive effects,<sup>3</sup> on the life of individuals and on human societies. On the other hand, the concept of mis-exaptation (Agnati, Barlow et al., 2012) can shed some light on the possible perverse side-effects of intolerant religious beliefs.

Thus, the main purpose of the present article is to discuss some aspects of religious beliefs through an analysis of the possible conceptual and neurobiological links between exaptation and mis-exaptation within the framework of the extraordinary human ability to anticipate the future, which, *inter alia*, leads to human awareness of the transience of life. Indeed, imaginary/imagination processes play a fundamental role in the anticipation of possible future scenarios on the stage of the inner theatre (Baars, 1983). Furthermore, a crucial aspect of the human mind is also the peculiar prerogative of being able to assign a probability value to each of these possible future scenarios (Alexander and Brown, 2011; Knutson & Greer, 2008; Pessiglione, Seymour, Flandin, Dolan & Frith, 2006).

Indeed, as pointed out by Changeux (Wacongne, Changeux & Dehaene, 2012; Dehaene and Changeux, 1991) especially in human beings the brain is not a passive input/output device, but acts as a predictive system capable of anticipating the future and, on that basis, it proceeds to decision-making. Hence, the understanding of the neural mechanisms by which the brain generates predictions is not only an important goal for neuroscience but also has social implications, since this anticipatory capability and a rational determination of the degree of probability of each of the possible future scenarios are fundamental components of human actions.

In the present paper, some aspects of the neural circuits and their chemical coding involved in decision-making processes, especially those activated by a never experienced stochastic event or by events that have different emotional implications, will be briefly mentioned. Actually, it could be surmised that this topic may have some relevance to suggesting which neural circuits are involved in the assignment of a subjective probability to that particular emotionally rich event, such as an after-death life. However, as will be discussed below, rather than assigning a high probability to an after-death life, some religions prefigure an extraordinary reward for the faithful. Moreover, being protected by superhuman powers is a reward for believers here and now, providing them with reassuring certitude in everyday life. By contrast, most religions prefigure horrible post-life punishments for unbelievers.<sup>4</sup>

This drastic dichotomy will be briefly considered in Section 3 with reference to Pascal's wager,<sup>5</sup> which is basically a tentative

<sup>1</sup> de La Rochefoucauld (1665) (Réflexions ou sentences et maximes morales; 1665): “Le soleil ni la mort ne se peuvent regarder fixement”. An extraordinary book on many of these aspects, as well as on artworks that have been inspired by the after-death fate of human beings, is that of Cesare Mazzonis (2012). We might also mention a brief, but highly interesting, account of the concept of “soul” provided by Luca Vanzago (Breve storia dell'anima – Il Mulino Bologna 2009).

<sup>2</sup> Gotthold E. Lessing, Nathan der Weise, 1779: “Wisst Ihr, Nathan, welches Volk zuerst das auserwählte Volk sich nannte? . . . Den es auf Christ und Muselmann vererbte, Nur sein Gott sei der rechte Gott! . . . Wenn hat, und wo die fromme Raserei, Den bessern Gott zu haben, diesen bessern Der ganzen Welt als besten aufzudringen, In ihrer schwärzesten Gestalt sich mehr Gezeigt, als hier, als itzt?” [Do you know, Nathan, which community first proclaimed itself to be God's chosen people? . . . afterwards the arrogance that only their own God is the true God was transferred to the Christians and then to the Muslims]

<sup>3</sup> Artworks are often by-products of a human exaptation process that, in several instances, is triggered by religious beliefs. It should be underlined that artworks, and in general cultural products, play a fundamental role not only in interactions of a human subject with his socio-cultural environment (i.e., the so called supra-systems) but also in his psychic homeostasis (Young, 1974; Cela-Conde, Agnati, Huston, Mora, & Nadal, 2011; Agnati, Guidolin, & Fuxe, 2015). The survival value of psychic homeostasis (Eudaimonia) is emphasised by the evidence that it can sometimes override the regulatory mechanisms of bodily homeostasis, i.e., the controls that optimize the human being's interactions with his external physical environment (Schulkin, 2011; Sterling & Eyer, 1988).

<sup>4</sup> Cordero (1967) writes that “the verses of *Dies irae* demonstrate the hallucinatory state that the human being suffers on imaging his after-death fate” (see also Fig. 4 of the present paper)

<sup>5</sup> Blaise Pascal (1623–1662) was instrumental in pioneering a change in probability from what it had long been – calculations about games of chance – into something far more profound, i.e., a fundamentally new way of reasoning about nature, society and the human condition (Brown, 2003; Hacking, 1984).

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