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Science and human religiosity from the perspective of the cognitive science of religion

Introductory remarks

In its standard approach, the inquiry of the philosophy of religion relies on the assumption of the existence of God to assure the meaningfulness of its claims. Much of the explanatory effort within this discipline is also devoted to the survey of the proofs of the existence of God.¹ In addition to this, another crucial assumption is made, namely, that man as the one who is the subject of the religious belief is capable of acknowledging the existence of the Absolute. In philosophical considerations this capacity is referred to as *homo religiosus* and has been in use since the 19th century in the works of such famous figures as Hegel, Kierkegaard, Otto, Eliade, Tillich and Fromm.²

Since by its very nature philosophy of religion treats of the relation of man to a supernatural reality, it seems that it can hardly engage any scientific treatment for it tracks the human response to an entity that radically falls outside the scope of science. This is due to the principle of *causal closure* whereby any naturally occurring phenomenon must have a natural cause. So if one attempts to subject religion to the regime of the scientific method, one tacitly assumes

¹ Cf. Ch. Meister, *Introducing Philosophy of Religion*, London–New York 2009.

² Cf. T. DuBose, *Homo religiosus*, [in:] *Encyclopedia of Psychology and Religion*, vol. 1, eds D.A. Leeming, K. Madden, S. Marlan, New York 2009, p. 407.

that the religious phenomena do indeed originate from natural causes. Since religiosity is no doubt a world-wide phenomenon, it is not all surprising that attempts of its scientific causal explanation have become a routine research practice. These explanations need to be clearly distinguished from the *reasons* for accepting religious beliefs that include subjective religious experiences and practices although the connection between the two still awaits more in-depth study.

These outcomes coincide with rapidly developing cognitive sciences that yield novel in-depth knowledge in the area of anthropology especially in regards to the structure and functioning of the human brain. In particular, the scope the cognitive sciences is to investigate the relations between the activity of the neuronal networks and the human behavior. Since religion engages a very specific type of behaviors, it generates interest in the identification of their causes. The corresponding subdiscipline within cognitive science bears the name of the *cognitive science of religion*. Although it reaches back in its origins to the 90-ties of the 20th century to the works of Pascal Boyer,³ it received a major support in the works of a publicly outspoken American philosopher and cognitive scientist Daniel Dennett, especially through the publication of his book entitled *Breaking the Spell*.⁴

As a relatively new discipline, the cognitive science of religion receives growing attention of a diverse spectrum of researchers for it provokes fundamental questions of the nature of human religiosity.⁵ If it turns out that the human brain contains modules specifically designed for religious thinking, it will provide solid scientific support to the idea of the *homo religiosus*. Taken to the extreme, this result may be viewed as a claim that humans are doomed to be religious by natural necessity and religiosity is as inevitable as taking a breath. Although one could think that this will steer up considerable veto in the atheistic circles, the opposite seems to be the case. If religion indeed qualifies as a natural phenomenon then no supernatural agent needs to be invoked to justify its existence. Religion can positively serve subjective personal and social needs such as, for instance, personal well being, altruism and

³ P. Boyer, *Religion Explained: The Evolutionary Origins of Religious Thought*, New York 2001.

⁴ D. Dennett, *Breaking the Spell: Religion as a Natural Phenomenon*, New York 2006.

⁵ E.g. *The Believing Primate: Scientific, Philosophical and Theological Reflections on the Origin of Religion*, eds. J. Schloss, M. J. Murray, Oxford 2009. Also, publications are already available in Polish: e.g. K. Szocik, *Czy kognitywne nauki o religii mogą wyjaśnić religię?*, "Filozofia Nauki" (2014) no. 94(2), p. 120–131.

strengthening of communal bonds. Hence comes the now famous dictum: “explaining religion is explaining religion away”.⁶

The goal of this paper is to utilize the tools of the cognitive science of religion to provide a novel insight into the much debated question on how the rapid development of science impacts human religiosity. The study begins with a brief introduction to the evolutionary scenarios responsible for the capacity of the human brain to elicit religious behaviors conceived of as the acknowledgement of the existence of a supernatural agent. Secondly, the kinds of beliefs that are foundational for the origin of religious commitments are reviewed. Thirdly, the conceptual intricacies that arise as one attempts to define a notion of a god suitable in a purely natural discourse are surveyed. This ties in directly with the problem of supernaturalism in general and the panentheistic model of the relations of the Divine reality to the created order enable sheds new light on how the onset of the scientific picture of the world affects the acceptance of the belief in the existence of a supernatural agent. In addition to this, the dependence of the human religiosity on its embedment within a larger cultural context can be more thoroughly articulated.

Evolutionary accounts of religion

The introduction of the evolutionary scenarios into the studies of the origin and the dissemination of the phenomenon of religiosity has resulted in the diversity of approaches that hinge upon the major distinction, namely, whether religion should be treated as (1) the direct product of adaptation or (2) as an adaptive byproduct.⁷ In the first instance, it is maintained that religion came about due to the reproductive benefit it conferred. Although the particular proposals are many (e.g., enhanced ability for mating or reduction of stress due to fear), the *adaptive cooperation hypothesis* comes definitely to the fore as the most commonly accepted mechanism. Two main versions within this hypothesis can be distinguished: (1) detecting and controlling cooperative defection⁸

⁶ Cf. W. B. Drees, *Is Explaining Religion Explaining Religion Away?*, [in:] *The Concept of Explanation*, eds. B. Brożek, M. Heller, M. Hohol, Kraków 2016, p. 231–254.

⁷ E.g. S. Atran, *In God We Trust: The Evolutionary Landscape of Religion*, New York 2002.

⁸ E.g. J. Bulbulia, *Religious Costs as Adaptations that Signal Altruistic Intention*, “Evolution and Cognition” (2004) no. 10, p. 19–38.

and (2) coordinating cooperative strategies and goals.⁹ In regards to religion conceived of as an evolutionary byproduct, its emergence is viewed as being the incidental result of the functioning of the ordinary human cognitive capacities that have adaptively evolved to secure the perception on the natural level. This approach to the evolutionary origin of religion lies at the foundation of the contemporary cognitive science of religion with the *hypersensitive agency detection device* (HADD) receiving the widest recognition as the primary mental tool responsible for human religiosity.

In addition to the two evolutionary scenarios of the origin of religiosity, a third one can be singled out where the two scenarios just discussed are considered insufficient and the contribution of the cultural transmission of information must be taken into account. Undoubtedly, Richard Dawkins qualifies as the most outspoken voice in this regard as he promotes his view on religion as pathology that is culturally passed on by means of a memetic virus that infects the minds of children. Dawkins states blatantly that “religious ideas are virus-like memes that multiply by infecting the gullible brains of children”.¹⁰ Despite of the considerable public attention, this scenario has not received much support in detailed empirical and theoretical studies and it bears the stigmata of ideology. Additionally, the further substantiation of this scenario necessitates more in-depth understanding of the relationship between the genetic and cultural evolution.

Kinds of belief

The primary way in which the cognitive science of religion follows upon the idea of religion as the evolutionary byproduct is by claiming that the widespread character of the belief in God is due to the ordinary operation of natural human cognitive systems. From now on to the section on the agency detection mechanisms the exposition of the basic tools and tenets of the cognitive science of religion follows that of Barrett.¹¹ The proper discourse of this science in regards to the justification of the belief in the supernatural agency begins with

⁹ E.g. S. Atran, A. Norenzayan, *Religion's Evolutionary Landscape: Counterintuition, Commitment, Compassion, Communion*, “Behavioral and Brain Sciences” (2004) no. 27, p. 730–770.

¹⁰ R. Dawkins, *The God Delusion*, New York 2007, p. 205.

¹¹ J. Barrett, *Cognitive Science of Religion: From Human Minds to Divine Minds*, Conshohocken PA 2011; J. Barrett, *Cognitive Science, Religion and Theology*, [in:] *The Believing Primate... , op. cit.*, p. 76–99.

making a crucial distinction between the *non-reflective* and *reflective beliefs*. The non-reflective beliefs embrace the entire complexus of beliefs that are held on an unconscious level as a background and do not arise through deliberation. They originate as a result of the functioning of the *mental tools* that constitute evolutionary adaptive endowment designed to execute specific cognitive tasks. These tools are found in children prior to being rehearsed or taught through verbal instruction. The human mind is equipped with a large variety of mental tools that facilitate making sense of the surrounding reality resulting in the widely acknowledged *modularity* of the human brain often depicted with the metaphor of the Swiss-army knife.¹² In particular, the mental tools play important role in creating an intuitive *picture – ontology* of the physical reality that functions on a non-reflective basis. Thus, the proper meaning can be bestowed on this reality. This, in turn, warrants proper responses in real time processing. The non-reflective beliefs are of particular importance for the purpose of this study since they are responsible for the generation of the basic religious beliefs.

In contrast to the non-reflective kind, the reflective beliefs are consciously maintained and explicitly approved of and may be achieved through deliberation. In their formation, they heavily rely on the contribution of the inputs of the non-reflective beliefs. The probability of the acceptance of a given reflective belief depends on how many non-reflective beliefs come to its support. Interestingly enough, the reflective beliefs can be transformed into non-reflective ones by means of training and gaining expertise. This may concern simple activities like acquiring certain skills but also more elaborate training such as science. The highly non-intuitive character of the scientific knowledge, which reaches its climax in case of such abstract physical theories as quantum mechanics, faces great ballast from the non-reflective beliefs on the nature of the physical reality. Consequently, a network of institutions of higher learning must be engaged to assure the mastering and the efficient transmission of the scientific knowledge. Can the non-reflective beliefs be eradicated by the onset of scientific thinking? This question will be handled in more detail in the following section as the nature of the intuitive ontology is given a more in-depth consideration. However, it is worthwhile to mention at this point that the perspective of the transformative impact of science on the content of the

¹² J. A. Fodor, *The Modularity of Mind*, Cambridge MA–London 1983; P. Robbins, *Modularity of Mind*, [in:] *The Stanford Encyclopedia of Philosophy* (Winter 2017 Edition), ed. E. N. Zalta, <https://plato.stanford.edu/archives/win2017/entries/modularity-mind>, 1.09.2017.

non-reflective beliefs will inevitably lead to the relative character of the criteria of the acceptance of religious beliefs.

Before these investigative steps are carried out, another useful epistemological category needs to be introduced, namely, that of the *common sense cognition*. Although it appears in the philosophical discourse quite frequently, its use is far from uniform. As Barrett clearly points out, this notion was already present in the works of the eighteenth-century Scottish philosopher, Thomas Reid.¹³ Reid insisted that in addition to the rational mechanisms of generating beliefs, the human mind produces beliefs instantly without the support of evidence or argumentation. He names the cognitive tool responsible for this process the *common sense*. The common sense thus understood clearly embraces the aforementioned biological endowment of the human mind giving rise to the non-reflective beliefs. The biological endowment in turn serves as the justification of the commonality of this type of sense. In a broader sense, however, the common sense more frequently concerns the ensemble of the non-reflective beliefs formed with the appropriate cognitive tools. Once brought into the level of consciousness, these beliefs appear as self-evident. According to Reid, the common sense beliefs are held as long as no compelling reasons of their eradication ensue. Detailed studies of the common sense category reveal its variability with the impact of science being one of the key factors in its possible transformation thereby giving further support to the relative character of the the criteria of the acceptance of religious beliefs.

The intuitive ontology

In the next step, one needs to specify what kind of beliefs qualifying as non-reflective (intuitive) play an important function in the support of religiosity. For reasons that will become clear with the further progress of this study, these are the beliefs that express the most fundamental expectations on the nature of the physical reality, both inanimate and animate. In other words, the human mind is equipped with an array of mental tools that support the intuitive (pre-scientific) ontology of the surrounding reality. Although the full-blown catalog of these tools turns out to be quite complex, Barrett proposes an abbreviated list that narrows down to four basic ones that are sufficient for the

¹³ J. Barrett, *Cognitive Science...*, p. 93–95.

purpose of this study. These include: (1) naive physics,¹⁴ (2) naive biology,¹⁵ (3) agency detection device¹⁶ and (3) the theory of mind.¹⁷ Among others, the naive physics supports the expectation that bodies cannot penetrate through other solid objects or that bodies move only through the direct physical contact with their movers. This category correlates with the famous Aristotelian dictum: *omne quod movetur ab alio movetur* and it is enough to resort to the Newtonian dynamics to observe great explanative limitations of this principle. The mental tool of the naive biology, for instance, prompts the mind to non-reflectively expect that animals will give birth to animals of the same kind and that one of the primary occupations of the living organisms is the acquisition of food. The third tool, namely the agency detection device, immediately places an intentional agent having mental states as the cause of the self-perpetuated and purposeful motion. Mental states involve beliefs, desires, emotions, memories and precepts. The fourth level of the intuitive ontology bears the name of the *folk psychology* of the *theory of mind* (further denoted as ToM) and in Barrett's words is defined as: "regarding others as having minds and mental states and understanding how mental states relate to each other and to actions".¹⁸ The access to one's own mental states reinforces the natural conviction that humans do have ability to willfully choose their actions and thus influence not only their own behavior but to project this behavior on the surrounding reality.

Since according to the account of the cognitive sciences the mental tools of the intuitive ontology are considered to be biological endowment, the key question is to what degree their impact can be mitigated or eventually entirely neutralized. Barrett handles this issue based on the example of another interesting mental tool that relates to the intuitive ontology, namely, the tendency to explain reality in teleological terms. This means that humans have an in-born mental tool to perceive the reality as purposefully designed with

¹⁴ E. S. Spelke, A. Phillips, A. L. Woodward, *Infant's Knowledge of Object Motion and Human Action*, [in:] *Causal Cognition: A Multidisciplinary Debate*, eds. D. Sperber, D. Premack, A. J. Premack, New York 1995, p. 44–78.

¹⁵ F. C. Keil, *The Growth of Causal Understandings of Natural Kinds: Modes of Construal and the Emergence of Biological Thought*, [in:] *Causal Cognition...*, *op. cit.*, p. 68–98.

¹⁶ S. Baron-Cohen, *Mindblindness: An Essay on Autism and Theory of Mind*, Cambridge MA 1995.

¹⁷ H. Wellmann, D. Cross, J. Watson, *Meta-analysis of Theory of Mind Development: The Truth about the False Belief*, "Child Development" (2001) no. 72, p. 655–684.

¹⁸ J. Barrett, *Cognitive Science...*, p. 75.

an intentional agent as the author of this design. It remains beyond doubt that the case of the opposition to the theory of evolution in the ecclesiastical circles due to the elimination of the purposeful Creator as the author of the visible design in the Universe offers the most obvious example of the power of this particular mental tool. Indeed, this theory is usually approved of by relatively narrow scientifically literate circles through highly reflective deliberation contrary to the ensuing intuitions. Barrett concludes that these intuitions can be never entirely suppressed or out-grown, they can be only “tamed down” meaning that the tension between the scientifically acquired reflective ontology and the common sense picture of the world will always remain in force.¹⁹

As it has been explained above, however, the reflective beliefs can be nonetheless transformed into the non-reflective beliefs through rehearsal and possibly also through the cultural transmission of the scientifically modified common sense ontology that occurs in time. There are philosophical studies that attest to the feasibility of such a process.²⁰ As Liana clearly points out, this process is much slower compared to the rapid development of science indicating that although science will always remain ahead of the intuitive perception of reality, this perception will undergo slow transformation to accommodate what has been revealed by science.²¹ Based on this it seems rational to propose that the development of the scientific picture of the world may influence the non-reflective beliefs, that is, the content of the intuitive (folk) ontology of reality. Consequently, what once had been maintained to violate this ontology, may no longer be the case in light of what has been scientifically demonstrated. For instance, the suppression of such a violation seems to take place in terms of the motion of the iron strips in the magnetic field that does not display a visible contact of the mover with the object moved. It is quite unlikely that anyone with the average level of scientific literacy would qualify this phenomenon as being caused by a minded agent.

The cognitive idea of God

The cognitive science of religion demands the use of an operative idea of god so that proper inferences can be drawn within the theory's conceptual

¹⁹ J. Barrett, *Cognitive Science...*, p. 70–72.

²⁰ E.g. S. Zabieglik, *Krzywe zwierciadło filozofii, czyli dzieje pojęcia zdrowego rozsądku*, Warszawa 1987.

²¹ Z. Liana, *Teologia a naukowe obrazy świata*, [in:] *Wiara i nauka*, ed. J. Mączka, Kraków 2010, p. 84.

foundation. The theory is entirely natural, that is, it does not partake of any theologically impregnated content of the idea of god. On the contrary, it builds up this idea from within the conceptual content proper to its discourse to shed more light on how human brain supports thinking of an entity that may qualify as divine. The key term in this regard is *counterintuitivity*. An idea is counterintuitive if it violates the intuitive ontology, that is, the way in which the human cognition conceptualizes the surrounding reality by means of the non-reflective reasoning. Barrett defines this term as follows:

Counterintuitive, then, as a technical term motivated by current understanding of natural human conceptual systems, maps roughly onto how people often use the term supernatural or superhuman without running aground on the problem of specifying what is natural and what is “super” or above humans.²²

As Barrett points out, counterintuitivity is broad enough in its designation so that it can be applied cross-culturally in a variety of situations in which the explanations for a religious response are sought.

For this to occur, however, an additional condition on counterintuitivity needs to be imposed, that is, that the concepts involved must be *minimally counterintuitive*. This somewhat vague category was coined out by Barrett but the necessary background was given by a French cognitive anthropologist and psychologist, Pascal Boyer.²³ The vagueness of this category consists in that it calls for the violation of some of the assumptions of the intuitive ontology, “just enough of these assumptions to be attention demanding and to have unusually captivating ability to assist in the explanation of certain experiences”. It is precisely the two features, namely, (1) being memorable and (2) serving as efficient tools of bestowing meaning on the experienced reality that warrant their particularly quick dissemination in large spectrum of cultures. For instance, a tree that talks would qualify as a minimally counterintuitive concept. In regards to the explanative power of such concepts, Barrett singles out those that involve *agency* for they engage a uniquely rich array of mental tools that have high explanative power. They always include entities that do not act mechanistically but they elicit voluntary acts driven by their mental states. It is not surprising that most of the religious concepts rely on agency such as, for

²² J. Barrett, *Cognitive Science...*, p. 97.

²³ P. Boyer, *The Naturalness of Religious Ideas: A Cognitive Theory of Religion*, Berkeley, California 1994.

instance, gods, ghosts and spirits. In light of these considerations the following definition of religion, proposed by an American cognitive anthropologist, Scott Atran, seems to be fully justified:

Religion is a community's costly and hard-to fake commitment, to a counterfactual and counterintuitive world of supernatural agents, who master people's existential anxieties, such as death and deception.²⁴

Detecting agency

As it has been indicated above, humans have a natural tendency to prefer the attribution of a minded agent as a cause of the observed phenomena in making sense of the surrounding reality. A further explanative step, however, is required to justify why minded agents are indeed preferred. This step is provided by evolutionary psychology which aims at the reconstruction of the environments of the evolutionary adaptiveness (EEA) in which the observed behavior might have originated as an adaptive process. Since humans do commit errors, these evolutionary scenarios aim at the development of the proper mechanisms of error management in order to assure the reproductive success.

Stewart Guthrie, an American anthropologist, has suggested that these mechanisms are due to the so called *hypersensitive agency detection device* (HADD).²⁵ This device forces the human cognitive apparatus to attribute human-like minded agents to any movement that looks self-propelled and goal directed even at the cost of making an error. In case of the life and death alternative this cost is evidently low as compared to the loss of life and the resulting reproduction failure. In other words, the HADD is activated when it comes to the violation of the natural expectations in regards to the properties of motion whereby the observed activity is perceived as counter-intuitive. The HADD's conclusion on the presence of a minded agent triggers the theory of mind (ToM) to explain its actions in terms of its possible beliefs, desires or goals. The further attribution of the activity to a supernatural (divine)

²⁴ S. Atran, *In God We Trust...*, p. 4.

²⁵ S. A. Guthrie, *Faces in the Clouds: A New Theory of Religion*, New York 1993. The proper name of the *hypersensitive agency detection device* was coined out by Barrett: J. Barrett, *Exploring the Natural Foundations of Religion*, "Cognitive Sciences" (2000) no. 4(1), p. 31.

agency occurs because the registered counterintuitivity is best justified with the involvement of a superhuman force. For instance, a phenomenon which exceeds human capacity would more likely be linked with the intervention of a supernatural agent. In case the HADD makes an error, it bears the name of the *false positive*. Guthrie has claimed that as the cognitive mechanism HADD is primarily responsible for the belief in gods.

Counterintuitivity: vincible or not?

It has been so far established in the course of the of this study that the counterintuitivity as the main cognitive criterion of qualifying a given agent as supernatural bears a marked relative character. This leads to the inevitable conclusion that those who might have been doomed to religion in the past, do not have to form religious beliefs today. The counterintuitivity that follows upon the violation of the intuitive ontology varying with the development of science can be then fittingly named *vincible*. Can counterintuitivity be wholly conquered? This limiting situation could emerge only in an extreme case where all phenomena would be rationally explained by means of an intuitive ontology. This possibility does not find support neither in the method nor in the history of science which reveals that the formulation of a new theory always brings out deeper questions demanding further explanations. For instance, the general theory of relativity displayed its incompleteness as Stephen Hawking and Roger Penrose proved the famous singularity theorems in 1970 energizing the ongoing search for the theory of quantum gravity that is expected to answer questions on the nature of the spacetime singularities.²⁶

It turns out, however, that the vincibility of counterintuitivity may manifest its proper limits given two irremovable gaps that have been proposed by Michael Heller.²⁷ The *ontological gap* stems from the famous Leibnizian question “why is there something rather than nothing?”. It shows that science contains an inherent barrier in providing the explanation of why a formally consistent theory is capable of modeling the physical reality. The epistemological gap hinges upon the Einsteinian phrase that “the most incomprehensible thing

²⁶ S. W. Hawking, R. Penrose, *The Singularities of Gravitational Collapse*, “Proceedings of The Royal Society A” (1970) no. 314, p. 529–548.

²⁷ M. Heller, *Chaos, Probability and the Compressibility of the World*, [in:] M. Heller, *Creative Tension: Essays on Science and Religion*, Randor PA 2003, p. 127–143.

about the world is that it is comprehensible²⁸. It states that while science makes the Universe comprehensible, the explanation of this comprehensibility lies beyond its capabilities. Consequently, in the limiting case the transformation of the intuitive ontology by the development of science faces a definite boundary indicating that the counterintuitivity does indeed exhibit *invincibility*.

Two important remarks seem fitting at this point. First of all, although reaching the two gaps is hypothetically possible, for practical reasons it is extremely unlikely. As it has been mentioned above, the practice of science always reveals new dimensions of investigative efforts and science itself cannot provide any indications that these efforts are approaching a halt. This is consistent with the nature of mathematics as the language of the formal sciences consequent upon the Gödel limiting theorems.²⁹ Secondly, the anticipated extreme abstractness of theoretical formulations nearing the above mentioned gaps would so greatly exceed even that of quantum mechanics thereby neutralizing their potential in taming down the naive ontology and ultimately nullifying their ability to transform this ontology. To put things in short, the stock of counterintuitivity in nature will not be exhausted anytime soon so that the cognitive mechanisms responsible for the generation of the belief in an intentional agent will continue to have a chance of being activated. As a result, the vincibility of counterintuitivity will remain operative whereby counterintuitivity will remain relative as the criterion of supernaturality.

Understanding supernaturality

A more careful analysis of the concept of supernaturality used so far raises several concerns. Although it is correctly generated from within the context of the cognitive sciences, it evidently refrains from any assumptions on the model of the relation between the Divine reality and the created order. Without such a model, supernaturality equated with counterintuitivity is semantically quite handicapped for, as it has been shown above, the vincible character of counterintuitivity makes this understanding of supernaturality entirely relative. In other words, it does not properly discriminate between what is natural and supernatural in any theological sense of the term. Indeed, if the cognitive mechanisms discussed in this study interpret many of the counter-intuitive phenomena as a superhuman agency then the pantheon of gods may turn out

²⁸ A. Einstein, *Physics and Reality*, [in:] A. Einstein, *Ideas and Opinions*, New York 1978, p. 283–315.

²⁹ Cf. S. Krajewski, *Twierdzenie Gödla i jego filozoficzne interpretacje*, Warszawa 2003.

to be unnervingly overcrowded meaning that idolatry of false positives would flourish. After all, what masters people's anxieties does not have to be of a strictly supernatural origin. This inference is not at all surprising for in primitive societies and tribes where science has not entered with its rational explanation of the natural phenomena, the reality is full of ghosts and deities. Also, this lends its expected support to the cross-cultural universality of religiosity which is generally observed to diminish in highly developed societies where the scientific picture of the world permeates their culture.

Without an externally supplied model of supernaturality, the semantic overlap of supernaturality with counterintuitivity has one more positive consequence, namely, it offers a clear example of an error managing device. Accordingly, the human mind will not make an error if this is the true God causing the observing phenomenon and will thus correctly attribute the phenomenon to the divine agency. This situation well correlates with the famous Pascal's wager in which the assumption of God's existence is preferred for the costs of denying God's existence are far too great in case He does indeed exist. So the cognitive science of religion seems to yield considerable support for the Pascal's wager by identifying the cognitive mechanisms which facilitate proper error management and taking the safer course in regards to things that, if true, are of utmost importance.

The conceptual limitation of supernaturality equated with counterintuitivity can be significantly enriched with the engagement of a theologically motivated model the relation of the Divine reality to the created order. Interestingly enough, such a model seems to be supplied with the cognitive HADD mechanism where an intentional agent plays a central role as a cause of the observed phenomena. The activity of such an agent is consistent with the common sense models of the efficient causality when a mover is other than a thing moved. These models lend support to the *interventionist schemes* of the Divine action in the Universe where the Divine activity is portrayed as an intrusion into the once and for all established natural order. These common-sense models flourished in the medieval theology especially in the explanation of miracles and their influence seems to be felt even until the present day. For instance, a clearly interventionist model of miracles was endorsed by St. Thomas Aquinas.³⁰ In principle, these models imply the absolutely invincible counterintuitivity for no one can ever provide a natural explanation of a purely Divine act that transcends the natural order. Inasmuch as the cognitive agency detection mechanisms would properly recognize such interventions as supernatural,

³⁰ St. Thomas Aquinas, *Summa Contra Gentiles*, III, 102.

their verdict of supernaturalism could be easily lifted once a natural (scientific) explanation of an allegedly miraculous phenomenon became available. This state of affairs is a major disadvantage, however, for it creates a straight path to atheism which currently manifests itself in the scientific atheism represented by such figures as Stephen Hawking and Richard Dawkins.

Moreover, the interventionist model presents difficulties in view of the prevalent theological conviction on God being both *transcendent* and *immanent* with respect to creation. While transcendence means God's otherness, immanence connotes God's constant presence within the created order. Such a stance is currently best represented by *panentheism* that has been embraced not only from philosophers³¹ but also from theologians who consider creation to take place within the structure of the Holy Trinity.³² Interestingly enough, panentheism gains its major support from the scientifically motivated model of the relations between God and the created order.³³ This model implies that God does not operate through supernatural interventions but through the natural course of events because this course is also His action. In such instance, the category of the vincible counterintuitivity does maintain its effectiveness in generating the belief in God as a minded agent for, as it has been already mentioned, the depths of the mysteries of nature will not be exhausted to entirely eliminate the counterintuitivity effect. Since in the panentheistic model everything that happens is also a Divine work, the elimination of counterintuitivity through the scientific discoveries does not substantiate the atheistic claims as it was the case for the interventionist models.

Conclusions

The investigations carried out in this study have revealed that the use of the tools of the cognitive science of religion allows to predict a noticeable impact of the onset of the scientific picture of the world on human religiosity. Despite of the innovative character of these tools, however, they seem to introduce a conceptual conundrum insofar as they employ the theologically impregnated term of supernaturalism. Since the cognitive analysis of religion is capable of revealing

³¹ Cf. J. Życiński, *Naturalizm i transcendencja*, Kraków 2014.

³² Cf. D. Edwards, *The God of Evolution. The Trinitarian Theology*, New Jersey 1999.

³³ Cf. A. Peacocke, *Articulating God's presence in and to the world unveiled by the sciences*, [in:] *In whom we live and move and have our being*, eds. W. P. Clayton, A. Peacocke, Grand Rapids MI–Cambridge 2004, p. 137–154.

the natural causes of religion only, the consequent reference to supernaturalism demand at least implicit assumption of a model of the relation between the Divine reality and the created order. The transition from the intuitive interventionist model of this relation to the panentheistic one seem to alleviate the weight of the atheistic claims in case the counterintuitivity is scientifically conquered and to create a more fitting naturalist environment for the method of the cognitive science of religion. More detailed methodological studies would have to be carried out to bring in more insight into this issue.

In regards to the specificity of the impact of the scientific picture of the world on human religiosity in light of the cognitive science of religion three cases can be singled out. The first one is the contemporary scientific atheists who drop their religious beliefs as the counterintuitivity of certain observed phenomenon is conquered. Since the intuitive interventionist model of the Divine action in the Universe remains operative, the failure of counterintuitivity immediately leads to the denial of the existence of a supernatural agent allegedly responsible for this action. Consequently, this results in the marked weakening of the power of miracles in the justification of faith. The second possible case are these believers who while being scientifically literate, subscribe to their views based on the intuitive ontology often inconsistent with scientific beliefs. Although such a stance may encourage the preservation of the many cherished religious traditions, it may lead to the eventual confrontation of faith and reason. The third case are those adherents of religion who managed to reflectively absorb the non-intuitive panentheistic model and are able to defend themselves from falling into atheism. The abundant mysteries of nature constantly reinforce their belief in a supernatural agency which both partakes of and transcends the natural order. Taking into account the power of the intuitive ontologies in supporting the beliefs, however, this group of believers is expected to be considerably less abundant. Detailed statistical studies would have to be performed to confirm these predictions. It has to be remembered, however, that the cognitive science of religion tracks the natural causes of religiosity only and as the subjective reasons for accepting religious beliefs are included, these outcomes may need to be revised.

ABSTRACT

The cognitive science of religion is a developing subdiscipline of the cognitive sciences which aim at providing the natural explanation of religion by indicating mental tools responsible for the acceptance of religious beliefs. The main goal of this study is to assess

the impact of the rapid development of sciences on human religiosity with the use of the conceptual means offered by the cognitive science of religion. Also, a discussion of the role of the models of supernaturalism is carried out with the indication that their introduction may be of great assistance in substantiating the outcomes of the cognitive treatment of religiosity. Possible responses to the impact of sciences on religiosity are surveyed.

KEY WORDS

cognitive science of religion, supernaturalism, counterintuitivity, ontology, hyperactive agency detection device

ABSTRAKT

Nauka a religijność człowieka z perspektywy religioznawstwa kognitywnego

Religioznawstwo kognitywne jest rozwijającym się obszarem nauk kognitywnych mającym na celu naturalne wyjaśnianie fenomenu religii poprzez wskazanie mentalnych narzędzi odpowiedzialnych za akceptację wierzeń religijnych. W niniejszym studium najważniejsze jest pokazanie, jaki wpływ na ludzką religijność mają dynamicznie rozwijające się nauki, przy pomocy narzędzi religioznawstwa kognitywnego. Przedstawiona zostanie także dyskusja nad rolą modeli nadprzyrodzoności, ze wskazaniem, że ich uwzględnienie może wspomóc wyprowadzane w ramach religioznawstwa kognitywnego konkluzje. Wyróżniono także możliwe odpowiedzi (reakcje) na ludzką religijność w wyniku przyjęcia myślenia naukowego.

SŁOWA KLUCZOWE

kognitywistyka religii, nadprzyrodzoność, kontrintuicyjność, przekonanie, ontologia, nadaktywny moduł detekcji sprawczości

BIBLIOGRAPHY

- Atran S., Norenzayan A., *Religion's Evolutionary Landscape: Counterintuition, Commitment, Compassion, Communion*, "Behavioral and Brain Sciences" (2004) no. 27, p. 730–770.
- Atran S., *In God We Trust: The Evolutionary Landscape of Religion*, New York 2002.
- Baron-Cohen S., *Mindblindness: An Essay on Autism and Theory of Mind*, Cambridge MA 1995.
- Barrett J., *Exploring the Natural Foundations of Religion*, "Trends in Cognitive Sciences" (2000) no. 4(1), p. 29–34.

- Barrett J., *Cognitive Science, Religion and Theology*, [in:] *The Believing Primate: Scientific, Philosophical and Theological Reflections on the Origin of Religion*, eds. J. Schloss, M. J. Murray, Oxford 2009, p. 76–99.
- Barrett J., *Cognitive Science of Religion: From Human Minds to Divine Minds*, Conshohocken PA 2011.
- Boyer P., *The Naturalness of Religious Ideas: A Cognitive Theory of Religion*, Berkeley, California 1994.
- Boyer P., *Religion Explained: The Evolutionary Origins of Religious Thought*, New York 2001.
- Bulbulia J., *Religious Costs as Adaptations that Signal Altruistic Intention*, “*Evolution and Cognition*” (2004) no. 10, p. 19–38.
- DuBose T., *Homo religiosus*, [in:] *Encyclopedia of Psychology and Religion*, eds. D. A. Leeming, K. Madden, S. Marlan, vol. 1, New York 2009, p. 407.
- Dawkins R., *The God Delusion*, New York 2007.
- Dennett D., *Breaking the Spell: Religion as a Natural Phenomenon*, New York 2006.
- Drees W. B., *Is Explaining Religion Explaining Religion Away?*, [in:] *The Concept of Explanation*, eds. B. Brożek, M. Heller, M. Hohol, Kraków 2016, p. 231–254.
- Edwards D., *The God of Evolution. The Trinitarian Theology*, New Jersey 1999.
- Einstein A., *Physics and Reality*, [in:] A. Einstein, *Ideas and Opinions*, New York 1978, p. 283–315.
- Fodor J. A., *The Modularity of Mind*, Cambridge MA–London 1983.
- Hawking S. W., Penrose R., *The Singularities of Gravitational Collapse*, “*Proceedings of The Royal Society A*” (1970) no. 314, p. 529–548.
- Heller M., *Chaos, Probability and the Compressibility of the World*, [in:] M. Heller, *Creative Tension: Essays on Science and Religion*, Randor PA 2003, p. 127–143.
- Guthrie S. A., *Faces in the Clouds: A New Theory of Religion*, New York 1993.
- Krajewski S., *Twierdzenie Gödla i jego filozoficzne interpretacje*, Warszawa 2003.
- Meister C., *Introducing Philosophy of Religion*, London–New York, 2009.
- Peacocke A., *Articulating God’s presence in and to the world unveiled by the sciences*, [in:] *In whom we live and move and have our being*, eds. W. P. Clayton, A. Peacocke, Grand Rapids MI–Cambridge 2004, p. 137–154.
- Robbins P., *Modularity of Mind*, [in:] *The Stanford Encyclopedia of Philosophy* (Winter 2017 Edition), ed. E. N. Zalta, <https://plato.stanford.edu/archives/win2017/entries/modularity-mind>.
- Keil F. C., *The Growth of Causal Understandings of Natural Kinds: Modes of Construal and the Emergence of Biological Thought*, [in:] *Causal Cognition: A Multidisciplinary Debate*, eds. D. Sperber, D. Premack, A. J. Premack, New York 1995, p. 68–98.

- Liana Z., *Teologia a naukowe obrazy świata*, [in:] *Wiara i nauka*, ed. J. Mączka, Kraków 2010, p. 69–89.
- Spelke E. S., Phillips A., Woodward A. L., *Infant's Knowledge of Object Motion and Human Action*, [in:] *Causal Cognition: A Multidisciplinary Debate*, eds. D. Sperber, D. Premack, A. J. Premack, New York 1995, p. 44–78.
- Szocik K., *Czy kognitywne nauki o religii mogą wyjaśnić religię?*, "Filozofia Nauki" (2014) no. 94(2), p. 120–131.
- The Believing Primate: Scientific, Philosophical and Theological Reflections on the Origin of Religion*, eds. J. Schloss, M. J. Murray, Oxford 2009.
- Thomas Aquinas, *Summa Contra Gentiles*, III, 102.
- Wellmann H., Cross D., Watson J., *Meta-analysis of Theory of Mind Development: The Truth about the False Belief*, "Child Development" (2001) no. 72, p. 655–684.
- Zabieglik S., *Krzywe zwierciadło filozofii, czyli dzieje pojęcia zdrowego rozsądku*, Warszawa 1987.
- Życkiński J., *Naturalizm i transcendencja*, Kraków 2014.