Abstract
Evolutionary psychology is a relatively new approach to human development, which has lately brought valuable and insightful conclusions that contribute to explaining human nature. The present article proposes to explore the mentioned domain's point of view regarding the adaptive function which superstition might have played along the evolutionary time. The subject is of interest regarding the fact that superstition is still prevalent within our own culture but also most of other cultures, despite the fact that science's contribution to explaining the world we live in has reached levels high enough to offer most of the answers we might be looking for. Superstition seems to be a "shortcut" for rational and causal thinking, in which the superstitious subject prefers to fill in the information gaps regarding a given situation and chose the action to be taken under the bases of the highest perceived benefits or of the existing available information, whether we speak of inherent, evolutionary-based information, cultural views or the simple observation of coincidence.

Keywords: evolutionary psychology, superstition, adaptation

1. INTRODUCTION

Evolutionary psychology has lately become one of the most influential research approaches in psychology; according to Mitchell (1999), this area of study proposes to offer explanations of the functioning of all psychological processes by analyzing them from the perspective of their adaptive significance. Similar to evolutionary biology, evolutionary psychology studies these dimensions and their development through the evolutionary time. According to the same author, the evolutionary psychology methodology's purpose is to explain the structure of given mental phenomena.

Superstition has been long known to be most of all related to the supernatural by our ancestors, who needed explanations for natural phenomena and they seemed to be highly preoccupied in avoiding offending spirits and gods, according to Robert Park (2009). The author considered that nowadays we are still functioning
by the same coordinates as he finds present religious rituals highly similar to the ancient customs related to the supernatural: he states that they work only randomly, therefore no causality can be identified in such context. What actually happens is that certain conditions have initially been associated to a given outcome and we tend to re-create them over and over again (therefore, building superstitious rituals); usually, the most common intention of the superstition is too make us avoid unpleasant outcomes and, as Park (2009) mentions, kept under a harmless level, superstition might increase one's confidence.

2. DEFINITIONS AND PERSPECTIVES ON SUPERSTITION

At first sight, professional literature seems to approach superstition with reticence, as despite the impressive volume of information available to explain the world we live in, it has been shown that most people tend to almost ignore that kind of information. Authors such as Beck, Forstmeier (2007) raise the attention to the fact that superstition, along with religious beliefs are one of those elements that are present all over the planet, no matter the culture, but they emphasize the existence of examples which show no proof of benefits to be much higher than costs to support the preference of human individuals towards the discussed systems. Therefore, the challenge of evolutionary psychology regarding superstitions, representing such widely spread way of explaining the world, consists in proving that humans adapt through keeping superstitions. Such approach would clarify the reason they still function and are adopted by many individuals.

Zhang, Risen and Hosey (2013) suggest that superstitions might be sustained by lower costs relative to perceived benefits (namely subjective benefits evaluated strictly only by the individual’s knowledge and not by considering external facts) and by each individual's prior beliefs related to the given subject or situation. This point of view, as suggested by Beck and Forstmeier (2007) might be supported by research conducted by using neuroimaging techniques: the authors quote studies which have shown that the human brain responds to the consistency or inconsistency of external information to our prior existing beliefs. In other words, when a human individual comes in contact with evidence of what he already believes, learning and memory brain areas are activated while the contact with information which disproves to one’s beliefs activates areas responsible with error detection and conflict resolution.

Several models have been formulated aiming to explain the reason why people still appeal to superstition, whether as a way of understanding certain events or as an avoidance-type of behavior having the perceived role of protecting the individual of negative outcomes.

One of the most common of such models is based on the fact that human individuals, along with other organisms, learn from the observation of coincidence, method known as the associative learning (Beck, Forstmeier, 2007). The argument is that the set of rules which makes individuals chose superstition as a reference
system is actually similar to the mechanism of rejecting the null hypothesis in
statistics, having in sight the best way of risk reduction and comparing the present
facts to previous experience. Basically, this mechanism refers to risk management
and it represents a choice between the costs of an assumed type I error
(correspondent to superstition or believing in false statements) and the costs of an
assumed type II error (correspondent to ignorance or rejecting true facts). The view
according to which the present prevalence of superstition can be explained by
analogy to the choice between two types of statistical errors is shared by several
evolutionist authors (Foster, Kokko, 2009; Zhang, Jane, Hosey, 2013; Abbot and
Sherratt, 2011). Among the mentioned authors we find the idea that this function of
the superstition to choose between two types of error can be described as an
adaptive function (therefore, inherent to evolution). Zhang at al (2013) add further
information to this analogy and conclude that the main aspect behind such
mechanism is a strategy consisting in switching between exploration and
exploitation. An individual uses the available information (namely, exploits),
action considered to maximize its fitness or he can chose to obtain more
information regarding the truth behind the causal relationship and thereby, to
explore. In order to clarify the causal relationship between an action and a certain
outcome, an individual should evaluate whether it is more or less likely that the
outcome occurs and what action (or non-action) he should apply (Abbott, Sherrat,
2011) – this being the modality in which exploration takes place. Following a
series of similar events or situation, the individual will no longer add any
information and will tend to choose the action that might bring the highest reward,
as subjectively perceived; this mechanism is applied to superstition as it will be
preferred as long as the related costs will be low ( Beck & Forstmeier 2007; Foster
& Kokko 2009 quoted by Abbott and Sherratt, 2011). The risk of choosing
superstition seems to be lower compared to re-testing our hypothesis while
confronting a give situation.

Prior to approaching the subject of superstition's evolutionist function,
conceptual clarification should be mentioned.

According to Skinner's behavioral experiments conducted on pigeons (1948),
organisms tend to act as if there would be a causal relationship between a given
repeated behavior and a positive outcome, even if such causality does not exist; the
author applied his conclusions in order to explain several types of human behavior
such as gambling or influencing one's “luck” such as rituals applied prior to certain
events or regularly. Such rituals persist to exist even though it has long been
concluded that they have no significant influence on the expected outcomes, exept
from randomness.

Foster and Kokko (2009) consider that Skinner's approach offered two new
directions of analyzing superstition, valuable for its research: firstly, he was the
first to detect superstition among organisms different from humans (view
consistent with the evolutionist perspective) and secondly, he approached the
behavioral level of superstition (therefore, separating it once again from belief,
namely the cognitive level of operating).
Based on Skinner's theory on superstition, Beck and Forstmeier (2007) shortly define superstition as a wrong and strange idea about external reality. According to Foster and Kokko (2009), superstition does not only refer to a set of beliefs or an individual's attempts of explaining external phenomena, namely to cognitive aspects but also to behaviors – the two dimensions sharing an incorrect attribution of cause and effect. They quote the Merriam–Webster dictionary according to which the superstition is whether a belief or action which can result from ignorance, fear, trust in magic or chance, or a false concept of the causal relationship.

Abbott and Sherratt (2011) consider that superstition should be defined in the context which involves the lack of rationality in believing the relationship between one action and a given outcome; in this situation, the subject relies on incomplete information regarding causality. The implication of this point of view is that superstition, on a behavioral level, has developed as an adaption to owing incomplete information. As a mechanism, superstition is developed by learning from the observation of coincidence (Beck and Forstmeier, 2007); the opposite and maybe ideal situation would be to gather as much information related to a situation or context before taking an action.

On the other hand, superstition should be distinguished from belief, which according to Beck and Forstmeier (2007) can be considered to be a non-tested hypothesis, a way of filling the gaps of not being able to observe underlying mechanisms directly; beliefs are congruent to the human need of finding functioning patterns to compose our view about the world and environment. The authors quote Fugelsang and Dunbar (2004) according to whom regularity, if observed, can be accepted as real under the conditions of finding a mechanism to sustain it.

Beliefs, therefore, according to the mentioned authors, have the role of detecting and explaining patterns and regularities; from an evolutionary point of view, it seems that human characteristics have been selected so they would identify patterns, fact proven by our tendency to do so even if such patterns are not there. Another important conceptual clarification offered by Beck and Forstmeier suggests that superstition has evolved as a result of active searching for patterns (therefore operates under the basis of coincidence and observation) and that beliefs are actually the result of the natural need of explaining such patterns (being therefore linked to causal thinking). Superstition is, therefore, opposed to causality, which is the best way known so far to explain the events we are exposed to: every physical effect is caused by a physical reason (Park, 2008).

Beck and Forstmeier (2007) describe causal thinking as including the understanding of physical forces which affect objects through mechanical properties, having the main purpose of inferring predictions of future outcomes; it is mentioned that causal thinking has made us able to understand and influence our environment, respectively has given us evolutionary advantage.

Abbott and Sherratt (2011) proposed a model that inferred the idea that superstition is developed around causal relationships which even they do not exist.
are only perceived by the subject), are plausible without the basis of experience; they further take into consideration the fact that such credibility can be based on instinctive or learned understanding regarding the environment but can also find it's basis in the beliefs which belong to others. It seems that cultural influences play a strong part in managing actions in the cases where an individual does not come in contact with the opportunities to exploit the presence or lack of the causal relationship.

It is considered that superstition is found among organisms capable of associative learning. This type of learning is recognized through it's effects of triggering behavioral changes which are related to relations between external events (de Hower, 2009); the effects are further incorporated in the memory as associations. Such learning incorporates the mechanisms of classical and operative conditioning. Therefore, it can be found not only among humans. The following mechanism derives from the organism facing the choice between detecting an existing pattern or establishing the existence of pattern where in reality, there is only randomness (therefore, taking action under the basis of superstition). In this case, superstition consists, for example, in avoiding harmless agents, whether foods, animals or interpreting several signals from nature as proof of approaching predators. Therefore, superstition might have played along generations the role of keeping the subjects at safe, namely choosing the situation of the lowest potential risk.

On a behavioral level, Abbott and Sherratt (2011) describe superstition as both actions and lack of actions which have the role of affecting the probability of a beneficial outcome in the conditions of lacking causal relations between the action and expected outcome, definition which according to the authors is also consistent to the one proposed by Skinner. Abbott and Sherratt (2011) conceptualize superstitious behavior as being composed by prior belief, chance events and using incomplete (available) information.

3. NATURAL SELECTION AND SUPERSTITION

There are three possible ways in which superstition can appear, according to Beck and Forstmeier (2007): it can be created by the individual himself (in a way similar to the one described in Skinner's experiment), it can be a cultural inheritance (superstitions which seem to be part of common knowledge) or genetically inherited (this would be the case of being afraid of harmless animals, for example). They propose the hypothesis that natural selection has favored a learning strategy involving three main directions, namely searching for regularity patterns using indicators from the environment, attempting to make sense of a causal mechanism to explain such patterns, continuing, if necessary, by formulating new assumptions to explain the patterns and finally testing if these assumptions are available during following circumstances. The purpose of such strategy, as further suggested by the authors, would be to help distinguish between patterns and
randomness. They also consider, regarding causal thinking and the way we interpret events, that those human characteristics have been selected that enable us to process the environment in terms of causality and intentionality, considering the fact that the two have contributed to building valuable abilities.

Additionally, Foster and Kokko (2009) state that such naturally selected strategies might involve types of behaviors which correlate to superstition, namely consist in actions which do not follow an existing causal relationship. On the other hand, if taking such actions under based on the observation of previous registered benefits, the slight probability of reaching them might be enough to keep applying the superstitious behavior (Foster, Kokko, 2009).

As for the prevalence of superstition, Abbott and Sherratt (2011) state that the phenomenon is common in the situations when it comes along with high perceived benefits (given the context where the subject chooses superstition in the attempt of influencing a certain expected outcome). The authors expect that superstition would apply in the situation in which the subject has had several previous experiences in which he has witnessed beneficial effects.

4. CONCLUSIONS

Further investigations are recommended to be conducted regarding superstition and it's adaptive function within the human evolutionary time. As shown, it seems that superstition brings several benefits to the subject such as filling information gaps, rapid learning, allowing more rapid choices of actions. At a closer look, though, such benefits are only superficial ones, as experience has shown that evidence-based causal thinking and the efforts of obtaining information have contributed to our cognitive adjustment and environment management. We therefore propose several directions of further investigation such as the correlation between perceived benefits and risk taking as modulating factors of adaption. Perhaps superstition might have been useful for our ancestors who were not entirely exposed to opportunities of obtaining valuable and valid information regarding causality and mostly used observation of coincidence in order to give sense of the world. Another aspect that should be further investigated regarding the adaptive function of superstition is it's gregarious dimension. From this point of view, we refer to rituals which involve an entire community (such as religious gatherings, praying within a group, etc) and their possible adaptive functions: was the group gathering valuable for enforcing the community, keeping the members safe from potential external attacks or only increasing the level of perceived safety? Also, in short, what are the actual present situations in which superstition might offer real, but not perceived benefits? We suggest that the fact that most of the children tend to be superstitious and in time, as they grow, tend to develop their causal thinking may support the idea that nowadays superstition is only an evolutionary residue. From this point of view, we might take into consideration the situations in which superstitious thinking protects us from potential danger (eating harmful foods, staying away from harmful perceived stimuli), even if such danger
is not present or real. On the other hand, such false-positive protection affects us by limiting our experience and exploratory behavior which have contributed so far to significant discoveries, verified and enforced by causal thinking. Such questions are to be answered in order to support us in reaching a better, more complete understanding of a still widely present phenomenon such as superstition.

REFERENCES


