

# Superstitions: A Culturally Transmitted Human Behavior

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**Abstract** Superstitious beliefs or behaviors arising from an environment derived stimulus of fear, uncertainty, or unpredictable situation help us to overcome such situations. Although superstition is not founded on scientific judgments, it exists in almost every human culture. Variation in superstitions can be explained with ideas of cultural evolution and environmental psychology. In a changed environment where an organism associates two events those were related in the past, but are no longer in existence produce superstition. Habit formation in our species is also related to existence of superstition. Habit plays role in learning and behavioral plasticity. A survey of literature reveals that superstition as a product of human-environment action requires understanding of culture, behavior and environment. The cheap superstition is common than superstition involving high costs. Superstitions exists an irrational belief and as a culturally transmitted behavioural habit.

**Keywords** Cognition, Behavior, Culture, Environment

## 1. Introduction

Any evolved activity that interacts with its environment, not a by-product or side effect of activity is behavior [1]. Understanding evolutionary explanations of behaviour needs an understanding about the basis of mechanisms of perception and reality [2]. Influence of genetic and environmental factors is consistent with Darwinian natural selection and places human behavior within a broad evolutionary framework. Meme, a unit of cultural transmission describes cultural evolution as developed by Blackmore [3] in the book, *The Meme Machine*. UNESCO was founded on idea of evolutionary humanism to overcome superstition and to enrich our cultures with scientific knowledge [4]. However, UNESCO works based to a definition of culture, set out in 1982 Mexico Declaration on Cultural Policies: "Culture is the whole complex of distinct spiritual, material, intellectual and emotional features that characterize a society or social group including the arts and letters, modes of life, fundamental rights of the human being, value systems, traditions and beliefs [5]". While each culture draws from its own roots, it would fail to blossom without contact with other cultures.

Our culture is shaped both by our action and our biology which in turn is shaped by gene-neuron-hormone environment interaction. Through mutation and selection, we have become ultra social. Our self-awareness due to

increase in brain size has created needs for better orientation in a physical- and social- environment, to sense cognitive chaos, and to explain the manifestations of physical world and our social environment. Number and design of our receptor molecules to provide the raw data are not sufficient for survival in today's complex environment. Memes change over time due to evolution of human culture. Specific human culture is influenced by cultural and commercial exchanges, experiences, technological advances and industrial development.

## 2. Explaining Superstition

The present communication discusses superstition in human under the following three heads:

### 2.1. Habit and Superstition

Habit plays role in learning and behavioral plasticity. A habit as a cognitive routine once triggered ends itself without conscious control. Habit is rigid, automatic, unconscious, and opposite of goal-directed action. Habits help individual in achieving a goal through improving performance. Research has been centered on behavioral patterns in animals [6]. The relationship between actions, habits and goals is important [7]. When the animal acts in spite of outcome devaluation [8] it is also a habit. Habits remain fixed and are performed automatically, following an action sequence [9]. Habits are based on plasticity of brain matter and are influenced by functioning of various brain regions [10]. After acquisition, habits act like instincts.

We try to incorporate good habits as our behavior. Bad habits take control of our behavior [9]. Habit is generally associated to cognitive control and goals [11]. Aristotle

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Published online at <http://journal.sapub.org/ijpbs>

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distinguished three kinds of acquired habits, originally termed dianoethical (theoretical) habit, ethical (behavioral) habit and technical habits [12]. Theoretical habits causes retention of learning but are different from memory. Other two types of habits improve behavior and cognitive abilities. Behavioral habits include decision making [13], moral judgments [14] and the interplay between cognition and emotion [15]. Technical habits include learned skills of doing, or are directed to an external goal. Such habits are rationally controlled and goal-directed, but are not just habits-as-routines. According to Averroes, technical habit (procedural learning) is “whereby we act when we will” [16]. Acquisition of cognitive-driven routines to achieve goal results in flexible performance. In behavioral habits, learning via non-cognitive repetition decreases the final performance as found in addictions, compulsions, slips-of-actions [17] and unconscious biases. Cognitively controlled habits achieve rationally proposed goals. Superstition is a culturally transmitted behavioural habit, an unconscious biasness which is acquired via non-cognitive repetition. Human neuroscience assumes the reward circuit [10] as an analog to that of non-human animals. We decide to perform the act that carries the highest subjective value depending on personal preferences. The brain area involved in cognitive control, the prefrontal cortex finds its greatest evolution in our species [18].

## 2.2. Belief and Superstition

Superstition is an unscientific belief. Our strong ability for causal thinking [19] ranges between understanding physical forces to read other’s purpose. The origin of our strong causal beliefs can be traced in animals with developed brains [20]. The world is not understandable to animals in terms of causes, or intentions [20]. The world can be explained considering the relationships between inanimate objects and tool making [20]. Perception of intentions of other individuals, results in a better competitive strategy and to manage the environment. Beliefs “are attempts to explain to ourselves theoretically the world we live in” [21]. Our social intelligence was fundamental to origin of religious beliefs. The creation of beliefs is a necessary by-product of strong causal thinking. Economic- and geographical- conditions help us to form beliefs. Alteration of such factors changes individual’s beliefs. However, superstitions, or superstitious beliefs are not founded on scientific judgments.

## 2.3. Perspectives of Superstition

Superstitions are found probably in all human societies [22]. How the costs result from such beliefs [23] outweigh the benefits is not clear. Skinner [24] gives an example of superstition in pigeons. Superstition is widely accepted as a wrong idea about external reality [25, 26]. An example for inborn components of the setting of human is the fear of snakes. We learn quickly that snakes are dangerous than to learn that they are not dangerous [27]. An observed regularity is easily accepted to us as real, if we find a plausible mechanism behind it [28].

Superstitious behaviors originate through wrong assignment of cause and effect. Superstition, an ingredient of an irrational belief is found in almost all cultures and is related to supernatural [29] like good, or bad luck [30, 31]. Superstition is a fabricated invalid [32] term, or myth and spurious activity (vide 31), or an invalid absurd narration, and legend [33], or a half-belief, or practice without any rational thought [34]. Superstition has its own functions in different societies and superstitious beliefs continue to exist [35]. Believing in magic or astronomy was not regarded as superstitions and non-scientific subjects [36] at a time. In modern day, what is not observable is labeled as superstition.

Superstitions may be religious, cultural and personal. Superstition is also classified as causal superstition and coincidental superstition [37]. Causal superstition, a part of a conscious belief in a relationship between the two events, is found in Skinner's experiment [24]. In Skinner’s experiment, pigeons found a relation between their head jerks and food appearance. Coincidental superstitions enjoy more ambiguity in causal correlation between a behavior and an outcome as found in beliefs on the origin of natural disasters in various cultures. Prevalent culture affects personal responses to environmental stimuli.

The intensity of superstition is not diminished in the 21st century. Some superstitious beliefs for example, number 13, are international. A relation between superstitious beliefs, ethnic feeling and a sense of existential security provides a value to superstitions [38]. Superstitions are not supported by evidence and appear generally to be a mystery [39]. Superstitious beliefs are significantly more prevalent in women than men and in less educated people [40]. Believe in superstitions decreases with the increase in age and education [41]. Women are more superstitious than men [42]. People with increased educational level are generally less superstition, but are more skeptics [43]. Religious and non-religious people enjoy almost equal level of belief in superstitions.

We are prone to believe in magic when face with high stakes, or a low chance of success, or unpredictable circumstances. Superstition has deep evolutionary and psychological roots which are embedded in our natural childhood development. Human brain is noted as a belief engine with the idea that “humans evolved to be skilled pattern seeking creatures. Those who were best at finding patterns left behind the most offspring. We are their descendants” [44]. Chabris and Simons [45] noted that “serves us well, enabling us to draw conclusions in seconds that would take minutes or hours if we had to rely on laborious logical calculations”. Shermer also stated that “the problem in seeking and finding patterns is knowing which ones are meaningful and which ones are not”. Shermer [44] makes it clear that “the belief engine is real. It is normal to all of us” [46]. Superstition is not an abnormal behavior and is not limited to traditional cultures, or race, religion, nationality; nor is a product of people of low intelligence, or lacking education. ...all humans possess it as a part of nature, built into our neuronal mainframe” [23].

Human understandings about the world are different in various societies and cultures [31]. Perhaps superstition varies region wise and country wise for this reason. The roots of superstition is embedded in human fears from incomprehensible, inexplicable, unpredictable, and destructive natural forces [47]. Individuals accept superstitious beliefs when they lose their sense of control over events and outcomes, or when the conditions are dubious [48]. Superstitions make individuals to perceive their surrounding worlds as meaningful, predictable, and controllable [49]. At the same time, it saves individual from the environment induced fear. Trobriand Islanders use magic when go for fishing in open seas. When they go for fishing in safe lagoons, they do not use magic [50]. Superstitious beliefs results from specific attitude about the relationship between human and magical thinking, when people believe that practicing some acts may cause a favorable outcome, although, they never judge any relationship between them [49]. Magic was more prevalent in ancient societies compared to today, as natural environment was threatening and mystical in the past. Superstition has an inverse relationship with the socio-economic status. There is a relationship between the ethnicity of individuals and superstitious beliefs.

### 3. Analysis of Research Works on Superstition

Knowledge of our ancestors about the natural environmental forces was limited. Superstitious beliefs perhaps helped to decrease their environment induced stress [51]. Superstition produces a false sense of having control over outer conditions [52], reduces anxieties [53] and is prevalent in conditions of absence of confidence, insecurity, fear and threat, stress and anxiety. When the events are interpretable, environment is transparent, and conditions are less ambiguous, individual become less superstitious [54]. When a committed behavior results in a specific outcome, we tend to relate them each other and make an inference. Such synchronicity between the act and outcome gains importance and repetition of such synchronicity amplifies the belief. Skinner's [24] study on pigeons and food, Wagner and Morris's [55] study on children show the creation of superstitious beliefs through synchronicity mechanism. Different variables affect tendency toward superstition.

Our brain responds differentially to evidence based on our beliefs [28]. Superstitious ideas might be acquired through verbal communication [56]. This puts some superstitions (avoiding the number 13) in a context of cultural transmission, which is influenced by cognitive and social constraints [57]. Superstition persists when it impose a relatively small cost but with potentially large benefit [58]. It is also predicted that superstition develops around the casual relationship that, while nonexistent, is plausible a priori [35, 58, see also 59]. The cheap superstition is more prevalent than superstition that involves high costs [58]. Superstition

has its roots in our species' youth, when our ancestors could not understand the forces and whims of natural world. Survival of our ancestors was threatened by predation, or other natural forces. Thus superstition can be explained from the view point of behavioural biology, cultural transmission as well as our interaction with the environment. The present communication has examined how the costs result from superstitious behaviors is outweighed the benefits. Functioning of our brain as a belief engine requires further study with a due consideration on the view that superstition is not an abnormal behavior.

### 4. Conclusions

The present study attempts to explain the existence of superstition with no apparent benefit over centuries and throughout the world. Careful analysis reveals that superstition is not an abnormal behavior. Conditioning is the cause of creation of superstition [24]. Superstition is more prevalent in challenging or stressful situations [60-62]. Further studies are required to evaluate the role of superstition in overcoming stress. Superstition gives an illusion of control to overcome stressful situation and provides performing enhancing ability to students and athletes [63]. Superstition has been studied for at least last 75 years from various countries of the world. Such study provide evidence of relationship of superstition with other factors like environment, culture, socio-economic variables, education level. The influence of superstition on consumer behavior specifying the underlying conscious- and non-conscious properties is also noteworthy [64]. Presently it is generally agreed that behaviour has genetic-, neuronal-, hormonal-, cultural- and environmental- basis. Future research should examine the genetic-, neuronal- and hormonal basis of superstition to clear our understanding on this issue.

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