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The Evolutionary Roots of Anxiety and its Implications for Socialization and Group Cohesion

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Abstract

Attempts to explain the evolutionary basis of anxiety as a reasonable reaction or valuable over-reaction to actual physical danger do not do justice to the robustness, intensity and resiliency of anxiety as a ubiquitous dimension of human existence. This essay proposes an alternative explanation based upon a clearer distinction between fear and anxiety. Fear is an instinctive reaction to external dangers; anxiety is a more complex psychological reaction involving more advanced cognition.

This article tells a story about the blossoming of fear into an almost universal human experience that was no longer simply a reaction to immediate physical danger. Previous stories have mostly focused on basic fear reactions and the adaptive value of a hypervigilant arousal response to real physical dangers in the environment. This article focuses on the time period, 30 to 70 thousand years ago, when human consciousness expanded to include significant room for complex social relatedness. Within this context, a more socially based anxiety with more complex cognition had significant adaptive value.

More specifically, fear morphed into a multifaceted anxiety that was moldable, flexible, interpersonal and capable of shaping cognition. This anxiety contributed to group cohesion, group loyalty and a deep commitment to the group's narrative. Fear as a reaction to actual physical dangers continued to exist, but now, Homo sapiens also experienced this more complex secondary emotion, anxiety, which had adaptive value in the survival and expansion of the population.

Keywords: Anxiety; Behavioral Modernity; Cooperation; Evolution; Evolutionary psychology; Fear; Great Leap Forward; Group cohesion; Loyalty; Socialization

The Prevalence of Anxiety

According to the latest NIMH statistics, an estimated 19.1% of U.S. adults suffered from an anxiety disorder last year and 31.1% of U.S. adults will experience an anxiety disorder during their lifetime [1]. This type of data inevitably focuses on those suffering from "pathological anxiety", requiring psychiatric or psychological treatment. Beyond these numbers, there is widespread agreement that almost everyone experiences mild to moderate anxiety on a regular basis. Anxiety is a significant component of the human condition.

Most current evolutionary theories focus on the benefits of being wired to recognize danger. The prevalence of anxiety is viewed as an unintended consequence of a critically needed readiness to react quickly to actual physical

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dangers. Even if the reaction is too intense or too frequent, having people wired to react quickly and intensely to danger is seen as a valuable adaptive contribution to the survival of the individual and their kinship group. Anxiety is necessary for the detection of threats and for preparedness in response to threats. The existence of pathologically excessive anxiety is viewed as a statistical byproduct of a normal curve in which the center of the curve is the common adaptive anxiety experienced by the "average" person. This perspective has been widely accepted within the field [2-10]. A few voices in the field have begun recognizing that fear and anxiety provide functions beyond the recognition of physical dangers. Plutchik [11] described the social regulatory function of emotions (including fear and anxiety) as vital for humans who often have conflicting self-interest. Similarly, Breggin [12] points out that guilt, shame and anxiety provide valuable inhibitions against aggression, enabling humans to live within families and larger groups without killing each other.

Human evolution occurred over the course of 5 to 7 million years. Those focusing on the adaptive advantages of anxiety as a strong signaling system are focusing on the millions of years in which fear developed and was refined by mammals (178 million years) and primates (50 to 55 million years). These writers are focusing on a time in mammalian, primate and Homo sapien development when significant physical danger was pervasive and survival required exquisitely refined danger detectors to be hyperalert to these physical dangers. A powerful early warning signaling and response system was necessary for survival.

Fear versus Anxiety

There is a tendency, even among professionals in the field, to conflate fear and anxiety. Steiner [13] while reviewing the history of scientific interest in emotions points out that a number of early researchers did not see the value of distinguishing between fear and anxiety. LeDoux [14] has argued that the failure of the field to consistently recognize the distinction between fear and anxiety has been an obstacle to our understanding of anxiety and to the development of better clinical interventions for anxiety disorders.

Watson [15], the first psychologist to study infant emotions, postulated the existence of primary emotions. He described fear, rage and love as primary emotions. All other emotions (including anxiety) were viewed as secondary, requiring experience and learning. Many other researchers have developed their own list of primary and secondary emotions. Almost all include fear as a primary emotion [16].

LeDoux and Pine [17] provide a neurological framework that helps to distinguish between fear and anxiety. They described two distinct neural networks: the first neural network, centered in the amygdala, is responsible for quick detection and response to threats; the second neural network is responsible for consciousness including the labeling of feeling states. The first neural network has its origins in our mammalian and primate ancestry. It is basically a stimulus-response system aimed at quickly detecting and reacting to danger. The second neural network is much newer, owing its origins to the birth of consciousness. Although LeDoux [19] emphasizes that the primitive "defensive survival circuit" operates unconsciously and does not have a name prior to input from cortical cognitive circuits, for the purpose of simplicity of presentation, this is the neural network that is commonly thought of as fear. Input from more advanced cognitive centers is required for the labeling of it as fear and, time permitting, for analyzing the threat, but the purpose of this circuitry is quick detection and response to external dangers. The second neural network involves more advanced cognitive involvement. This second network contributes to the more complex subjective states of anxiety. From the vantage point of survival, it was highly adaptive to maintain a primitive system of quick detection and reaction to danger that could operate independent of advanced cognition. Complex cognition (especially when accompanied by some degree of uncertainty) tends to be detrimental when faced with immediate physical danger.

The distinction between fear and anxiety as two different neural pathways suggests that fear and anxiety might have different evolutionary and adaptive histories. This article is based on the premise that fear is an instinctive reaction to external dangers and that anxiety is a more complex psychological reaction involving the full range of cognition based on one's unique history and subjectivity. Anxiety is diagnosed as pathological when it interferes in a significant manner with a person's day-to-day functioning [19]. This article focuses on the more common non-pathological anxieties of everyday life.

The Great Leap Forward or the Era of Behavioral Modernity

Those advancing the argument that the evolutionary basis of anxiety lies in the adaptive benefits of an early warning system are suggesting that human anxiety as we know it today is a byproduct of the adaptive function of fear as a quick signal of danger. They are focusing on the millions of years of evolving and fine tuning of fear reactions in mammals and primates.

I wish to focus on a different Environment of Evolutionary Adaptation. There is a growing consensus that a major breakthrough in *H. sapiens* development occurred around 40 to 50 thousand years ago (some say 30 to 70 thousand years ago). This period has been labeled The Great Leap Forward [20] or the Era of Behavioral Modernity [21,22]. It was truly a golden age for the transformation of *H. sapiens* into a species that more closely resembles modern human beings. Great strides were made in our cognitive abilities including

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significant enhancement in our capacities for abstract thinking, symbolism, art, music, and planning. Great strides were also made in our social-cultural functioning including more complex use of language and the development of larger cooperative social groups that went beyond kinship. It is believed that the cognitive, social and cultural growth that occurred during this period in time is what enabled *H. sapiens* to expand and become Earth's most dominant species.

This time period is the focus of a number of evolutionary thinkers who have written about the natural history of human beings. When E.O. Wilson [23] describes the development of human cooperation and when Curtis Mareon [24] describes the human "proclivity for collaboration or hyperprosociality", they are both zeroing in on this period in *H. sapiens* development as the beginning of a new era in *H. sapiens* cognitive, social, and cultural functioning. When Yuval Noah Harari [25] describes a "cognitive revolution" leading to the ability to develop an allegiance to a narrative (described as a "fiction"), which enabled *H. sapiens* to form cohesive groups that were larger than kinship groups, he is also highlighting this same time period in human history. All of these writers are recognizing a growth in the human capacity to work together in large cohesive groups. There is much debate about the details. Was this change gradual? Did it occur in significant leaps? How much of this change was a change in DNA? There is, however, widespread agreement that *H. sapiens* made great advancements during this time period in their cognitive and social-cultural functioning and became the human beings that are familiar to us today.

Main Thesis

It is my contention that psychological functioning grew more complex during the time of The Great Leap Forward and that anxiety, as we think about it today, expanded in its prevalence and purpose. During this golden age of human development, when *H. sapiens* were making great advancements in their cognitive, social and cultural functioning, the basic adaptive fear reaction of *H. sapiens* was expanded into a broad multifaceted anxiety that was particularly adaptive in the socialization of the child into a loyal member of a larger group that went beyond kinship. This complicated cognitive-social-emotional system of anxiety was refined during this golden age of development and provided significant evolutionary adaptive advantages that went well beyond the recognition of danger. Current evolutionary thinking has recognized the importance of human social development in facilitating human adaptation and expansion. Humans developed and expanded using larger groups to augment their adaptive advantages. I am suggesting that one ingredient of this social development was the expansion of anxiety.

H. sapiens already had a fine tuned system of fear. As *H. sapiens* developed greater complexity in their use of language, creativity and social organization, fear and cognition blended together and formed anxiety. This secondary emotion of anxiety expanded in scope in response to the adaptive opportunities that existed during The Great Leap Forward, which lasted in different degrees and intensities for at least 30 or 40 thousand years. More specifically, fear morphed into a multifaceted anxiety that was moldable, flexible, interpersonal and capable of shaping cognition. This anxiety contributed to group cohesion, group loyalty and a deep commitment to the group's narrative (the group's identity). Fear as a reaction to actual physical dangers continued to exist. But now, *H. sapiens* experienced this more complex secondary emotion, anxiety, which had adaptive value in the survival and expansion of the population. The prevalence and texture of anxiety today is a byproduct of the anxiety that blossomed during the golden age of *H. sapiens* development and we can better understand the purpose and meaning of anxiety today through understanding its original adaptive value.

The Role of Anxiety in Promoting Socialization and Group Cohesion

We have no way of observing anxiety as it existed during the time of the Great Leap Forward. Fossil records do not provide measures of anxiety or indications of the texture of anxiety. The best that we can do is observe anxiety in the present world and then speculate as to the adaptive advantages during that earlier time period. If we explore some of the attributes of modern day anxiety, we can see how anxiety is well suited for the task of socializing the child into the family and for reinforcing group cohesion.

Socialization begins within the family, but the family is already immersed in the beliefs and behaviors of their larger group or community. A core belief that parents instill in their children is the importance of becoming a loyal member of the parents' primary group or community. This belief is critical to survival and reproductive success. Families and the larger community work together to ensure the loyalty of the next generation. This process begins in infancy with parents and older siblings taking the lead role in the child's socialization. Anxiety is an ideal component of socialization. Children are born with or soon develop a broad capacity for anxiety, most of which does not have specific stimuli or cognitions attached to it. Although some argue that all young children develop a few specific fears, such as a fear reaction to loud noises, a fear of falling from heights and a fear of strangers, it is generally agreed that this list is short. Most anxiety does not have any inherently specific cognition attached to it, which contributes to the pliability of anxiety. Caring parents feel anxious for the safety of their child and embark on molding their malleable infant. Parents have a lifetime of learning about anxiety that they transmit to the child. Parents feel safer when their child learns to be anxious and cautious in the same way that the parents are anxious and cautious. Anxiety

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is usually somewhat visible and therefore available for commentary and conditioning. This facilitates the parental task of giving words to and molding their child's anxiety and belief systems. Anxiety captures the attention of the child and intensifies learning. The long period of dependency of children upon their families (and their community) provides a prolonged opportunity to indoctrinate the child into the values, beliefs and loyalties of the group.

Anxiety continues to exist beyond childhood. This anxiety can be used to mold and remold the individual by significant people or groups at every stage of life. Therapists report more success in reconditioning anxiety as compared to reconditioning anger, depression or addictions. The ongoing malleable of anxiety makes it a useful tool for forging and reforging group unity. The thinking of a group can shift quickly with its entire membership shifting in unison. Members may have the illusion of independent thought, but they are often guided by their overriding cognitive commitment to the group's beliefs and thought processes. This loyalty is reinforced by the need to avoid anxiety (psychic pain).

The need to belong is a powerful human motivation. The need to belong to a group that was larger than one's family or extended family grew in importance during The Great Leap Forward. Prior to this time of expanded *H. sapiens* functioning, the need to belong probably existed exclusively within kinship groups. During this Great Leap Forward, there was now increased group size, requiring more psychological work to create cohesion. It seems likely that these larger groups began as extended families grew in size to a point where the kinship connection was diffused. This would weaken reciprocity and loyalty between group members [26]. During this golden age of development, there was a shift from loyalty based exclusively on genetic or kinship connection to loyalty based on a commonly shared narrative [25]. Simultaneous with the development of shared narratives was the intensification of the need to belong to a larger group or community.

This need to belong to a larger group was motivated in part by the real fear that survival and reproduction without such a group was nearly impossible. It should be noted that the Great Leap Forward was occurring as the world was still experiencing the last Ice Age. *H. sapiens*, facing serious survival issues, were ripe for expanding anxiety and developing larger cohesive groups. Successful larger cohesive groups developed shared narratives that bonded people with a collective identity and purpose. The adaptive advantage of these larger cohesive groups was that they promoted the survival and reproduction of their membership.

Discussion and Conclusion

Anxiety is a normal part of human existence, experienced by most people throughout their lives. Indeed, the only individuals without anxiety are sociopaths, who are famous for their disregard of social norms. The rest of us suffer from a vulnerability to anxiety and the multiple ways that it can be used for socialization. Attempts to explain anxiety as a reasonable reaction or valuable over-reaction to actual physical danger do not do justice to the robustness, intensity and resiliency of anxiety as a ubiquitous dimension of human existence.

This article tells a story about the blossoming of fear into an almost universal human experience that was no longer simply a reaction to immediate physical danger. Previous stories have focused on basic fear reactions and the adaptive value of a hypervigilant arousal response to real physical dangers in the environment. This paper is focusing on the time period, 30 to 70 thousand years ago, when human consciousness expanded to include significant room for complex social relatedness. Within this context, a more socially based anxiety with more complex cognition had significant adaptive value.

By locating the expansion of fear into anxiety during The Great Leap Forward, I am focusing on the adaptive advantages of anxiety during a time when groups were expanding to include non-kin or very distant kin. It is generally agreed that cooperation helped *H. sapiens* to conquer the world. This cooperation developed simultaneously with the development of expanded cognition and expanded consciousness. Anyone reading E.O. Wilson's [27] work on the cooperation of ants is impressed with the complex cooperativeness of this primitive species. Similarly, anyone reading research on wolves or birds is struck by their capacity to seamlessly coordinate their efforts [28,29]. Such cooperation is far more difficult in species with advanced cognition and advanced consciousness, where each individual might potentially develop his or her own set of beliefs and values. *H. sapiens* with such advanced cognition and consciousness require a prolonged period of effective socialization to create group cooperation in thought and action. This socialization targets the newest members of the community, whether they are newborns or newly arrived. To understand the development of cooperation and loyalty to one's community, we must understand the powerful socialization that human communities employ. Anxiety and the need to belong are basic components of this socialization process.

I have focused on the years surrounding The Great Leap Forward or The Era of Behavioral Modernity as a convenient period in time when the issues being discussed crystallized and can be more easily displayed. It is my belief that these kinds of leaps do not occur in such a short period of time. Rather, there are a multitude of building blocks, small changes that eventually culminate in a larger, more visible qualitative shift in experience.

The development of loyalty to a group that transcended your immediate or extended family required a complex set of

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evolutionary adaptations. *H. sapiens* developed a set of needs, feelings and internal pressures that facilitated socialization into larger groups. It is unlikely that one gene alone created this loyalty and commitment. Rather, several dynamics and forces developed and combined to yield an outcome of heightened group loyalty and commitment. This heightened loyalty and commitment of the individual to a larger group provided for stronger group cohesion, which had significant evolutionary advantages over smaller or less cohesive groups. Evolutionists and geneticists struggle to determine whether this kind of behavioral and cultural transformation requires a change in genes, whether there might be a change in "gene regulation", or perhaps a combination of both processes [30].

I have focused on the advanced cognition and social organization of *H. sapiens* as if the experience of anxiety is unique to them. There is growing evidence of anxiety and stress in other species. Sapolsky [31] describes in great detail the adaptive benefits of acute stress responses and the health consequences of chronic stress responses in the animal world. Humans and other primates, owing to their more advanced cognitive structures, have more potential to develop stress reactions that are primarily psychological and more likely to become habitual. There is probably a continuum within the animal world with the more advanced species having both more advanced cognition and more complex anxiety. Understanding the nature and frequency of anxiety in other species and in our ancestors might provide a timeframe for the evolution of anxiety.

Prior theories of the evolutionary basis of anxiety have focused on fear reactions in adults and older children to actual dangers in the environment. They are focusing on the adaptive value of this fear reaction. By drawing a clearer distinction between fear and anxiety and then choosing to focus on anxiety, I am drawing attention to the world of the young child. In particular, I am focusing on the value that greater socially-based anxiety plays in the socialization of young children. This socialization is reinforced and sometimes altered throughout the course of life. Young children are more dependent, more vulnerable and more of a blank state, all of which contribute to their being more malleable than adults. Socialization, however, continues throughout the life cycle.

What is being described is a profound shift in human functioning that evolved over thousands of years. Descriptions of this shift are speculative. It's likely that this shift encompassed significant changes in social, cognitive and emotional functioning. On a social level, there was an increased need to belong to larger social groups that went beyond one's extended family. On a cognitive level, there was an increased ability to plan (involving anticipation) and an increased interest in explanatory narratives, both of which rely on cause and effect. On an emotional level, fear expanded in ways that went beyond immediate physical dangers into the more multifaceted phenomena of anxiety.

I am suggesting this in part because other explanations of the evolutionary adaptive value of anxiety do not do justice to the prevalence and robustness of anxiety and in part because of how anxiety interconnects with the social and cognitive developments that were occurring at that time. Anxiety brings people together and keeps them connected. Anxiety can contribute to the group's commitment to a shared narrative, thus creating a collective identity for members of the group.

H. sapiens developed a greater need for additional attachments and a growing need to belong to a group larger than one's extended family. Groups provided physical and psychological security. Anxieties related to one's secure membership in the group were also heightened. Explanatory narratives were expanding in their usage. These explanatory narratives helped to reduce the anxiety of the individual and helped to bind the individual to the group. The evolution of greater human anxiety provided additional fuel to help foster the cohesion of these larger groups that went beyond kinship. If group cohesion relied on the power of the group to reduce anxiety, then a heightening of the overall anxiety in *H. sapiens* was adaptive in that it provided more motivation for individuals to become loyal members of larger cohesive groups.

This article includes significant speculation. I therefore wish to conclude with a brief summary of that which I feel most confident: Anxiety is more complex than fear and therefore has a more complex evolutionary history; anxiety tends to be embedded in social contexts and is therefore well suited to contribute to the development of social organization and group cohesion including the ability of a community to maintain a uniform set of beliefs; in particular, anxiety plays a role in socialization and contributes to the individual's loyalty to the larger group or community. I am much less confident about the timeframe of the evolution of anxiety and the extent to which anxiety, as we know it, is shared with other species.

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