

# Evolutionary Psychology: Why Depression Persists

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Major depression is the leading cause of disability worldwide, and in 2000 was the fourth leading contributor to the global burden of disease (measured in DALYs); it is also an important risk factor for suicide. It is understandable, then, that clinical depression is thought to be a pathology -- a major dysfunction of the brain. In most cases, rates of organ dysfunction increase with age, with low rates in adolescents and young adults, and the highest rates in the elderly. These patterns are consistent with evolutionary theories of aging which posit that selection against dysfunctional traits decreases with age (because there is a decreasing probability of surviving to later ages).

In contrast to these patterns, prevalence of clinical depression is high in all age categories, including otherwise healthy adolescents and young adults. In one study of the US population, for example, the 12 month prevalence for a major depression episode was highest in the youngest age category (15-24 year olds). The high prevalence of depression is also an outlier when compared to the prevalence of major mental retardation, autism, and schizophrenia, all with prevalence rates about one tenth that of depression, or less.

The common occurrence and persistence of a trait like clinical depression with such negative effects early in life is difficult to explain. (Rates of infectious disease are high in young people, of course, but clinical depression is not thought to be caused by an infection.) Evolutionary psychology and its application in evolutionary medicine suggest how behaviour and mental states, including seemingly harmful states such as depression, may be past adaptations to recurring reproductive problems faced by our ancestors, actually having improved (however disadvantageous in the modern world), the fitness of either the individual or their relatives. It has been argued, for example, that Abraham Lincoln's life-long depression was a source of insight and strength. Some even suggest that "we aren't designed to have happiness as our natural default" and so a state of depression is the evolutionary norm.

The following hypotheses attempt to identify a benefit of depression that outweighs its obvious costs. All take as their starting point the fact that one of the most potent, well-established causes of major depression is a severe negative life event.

### **Psychic pain hypothesis**

One reason depression is thought to be a pathology is that it causes so much psychic pain and distress. However, physical pain is also very distressful, yet it has an evolved function: to inform the organism that it is suffering damage, to motivate it to withdraw from the source of damage, and to learn to avoid such damage-causing circumstances in the future.

According to the psychic pain hypothesis, depression is analogous to physical pain in that it informs the sufferer that current circumstances, such as the loss of a friend, are imposing a threat to biological fitness, it motivates the sufferer to cease activities that led to the costly situation, if

possible, and it causes him or her to learn to avoid similar circumstances in the future. Proponents of this view tend to focus on low mood, and regard clinical depression as a dysfunctional extreme of low mood.

### **Rank theory**

Rank theory is the hypothesis that, if an individual is involved in a lengthy fight for dominance in a social group and is clearly losing, then depression causes the individual to back down and accept the submissive role. In doing so, the individual is protected from unnecessary harm. In this way, depression helps maintain a social hierarchy. This theory is a special case of a more general theory derived from the psychic pain hypothesis: that the cognitive response that produces modern-day depression evolved as a mechanism that allows people to assess whether they are in pursuit of an unreachable goal, and if they are, to motivate them to desist.

### **Honest signaling theory**

Another reason depression is thought to be a pathology is that key symptoms, such as loss of interest in virtually all activities, are extremely costly to the sufferer. Biologists and economists have proposed, however, that signals with inherent costs can credibly signal information when there are conflicts of interest. In the wake of a serious negative life event, such as those that have been implicated in depression (e.g., death, divorce), "cheap" signals of need, such as crying, might not be believed when social partners have conflicts of interest. The symptoms of major depression, such as loss of interest in virtually all activities and suicidality, are inherently costly, but, as costly signaling theory requires, the costs differ for individuals in different states. For individuals who are not genuinely in need, the fitness cost of major depression is very high because it threatens the flow of fitness benefits. For individuals who are in genuine need, however, the fitness cost of major depression is low, because the individual is not generating many fitness benefits. Thus, only an individual in genuine need can afford to suffer major depression. Major depression therefore serves as an honest, or credible, signal of need.

For example, individuals suffering a severe loss such as the death of a spouse are often in need of help and assistance from others. Such individuals who have few conflicts with their social partners are predicted to experience grief--a means, in part, to signal need to others. Such individuals who have many conflicts with their social partners, in contrast, are predicted to experience depression--a means, in part, to credibly signal need to others who might be skeptical that the need is genuine. (A theologian might say that depression is like the difference between attrition and contrition. If it doesn't hurt it doesn't work). Put in simple language, depression may function to enforce sincerity.

### **Social navigation or niche change theory**

The social navigation, bargaining, or niche change hypothesis suggests that depression, operationally defined as a combination of prolonged anhedonia and psychomotor retardation or agitation, provides a focused sober perspective on socially imposed constraints hindering a person's pursuit of major fitness enhancing projects. Simultaneously, publicly displayed symptoms, which reduce the depressive's ability to conduct basic life activities, serve as a social signal of need; the signal's costliness for the depressive certifies its honesty. Finally, for social partners who find it uneconomical to respond helpfully to an honest signal of need, the same depressive symptoms also have the potential to extort relevant concessions and compromises. Depression's extortionary power comes from the fact that it retards the flow of just those goods and services such partners have come to expect from the depressive under status quo socioeconomic arrangements.

Thus depression may be a social adaptation especially useful in motivating a variety of social partners, all at once, to help the depressive initiate major fitness-enhancing changes in their socioeconomic life. There are diverse circumstances under which this may become necessary in human social life, ranging from loss of rank or a key social ally which makes the current social niche uneconomic to having a set of creative new ideas about how to make a livelihood which begs for a new niche. The social navigation hypothesis emphasizes that an individual can become tightly ensnared in an overly restrictive matrix of social exchange contracts, and that this situation sometimes necessitates a radical contractual upheaval that is beyond conventional methods of negotiation. Regarding the treatment of depression, this hypothesis calls into question any assumptions by the clinician that the typical cause of depression is related to maladaptive perverted thinking processes or other purely endogenous sources. The social navigation hypothesis calls instead for analysis of the depressive's talents and dreams, identification of relevant social constraints (especially those with a relatively diffuse non-point source within the social network of the depressive), and practical social problem-solving therapy designed to relax those constraints enough to allow the depressive to move forward with their life under an improved set of social contracts. This theory has been the subject of criticism..

### **Bargaining theory**

Depression is not only costly to the sufferer, it also imposes a significant burden on family, friends, and society at large--yet another reason it is thought to be pathological. Yet if sufferers of depression have real but unmet needs, they might have to provide an incentive to others to address those needs.

The bargaining theory of depression is similar to the honest signaling, niche change, and social navigation theories of depression described above. It draws on theories of labor strikes developed by economists to basically add one additional element to honest signaling theory: The fitness of social partners is generally correlated. When a wife suffers depression and reduces her investment

in offspring, for example, the husband's fitness is also put at risk. Thus, not only do the symptoms of major depression serve as costly and therefore honest signals of need, they also compel reluctant social partners to respond to that need in order to prevent their own fitness from being reduced.

### **Prevention of infection**

It has been hypothesized that depression is an evolutionary adaptation because it helps prevent infection in both the affected individual and his/her kin.

First, the associated symptoms of depression, such as inactivity and lethargy, encourage the affected individual to rest. Energy conserved through such methods is highly crucial, as immune activation against infections is relatively costly; there must be, for instance, a 10% increase in metabolic activity for even a 1° change in body temperature. Therefore, depression allows one to conserve and allocate energy to the immune system more efficiently.

Depression further prevents infection by discouraging social interactions and activities that may result in exchange of infections. For example, the loss of interest discourages one from engaging in sexual activity, which, in turn, prevents the exchange of sexually transmitted diseases. Similarly, depressed mothers may interact less with their children, reducing the probability of the mother infecting her kin. Lastly, the lack of appetite associated with depression may also reduce exposure to food-borne parasites.

### **Analytical rumination hypothesis**

This hypothesis suggests that depression is an adaptation that causes the affected individual to concentrate his or her attention and focus on a complex problem in order to analyze and solve it.

One way depression increases the individual's focus on a problem is by inducing rumination. Depression activates the left ventrolateral prefrontal cortex, which increases attention control and maintains problem-related information in an "active, accessible state" referred to as "working memory," or WM. As a result, depressed individuals have been shown to ruminate, reflecting on the reasons for their current problems. Feelings of regret associated with depression also cause individuals to reflect and analyze past events in order to determine why they happened and how they could have been prevented.

Another way depression increases an individual's ability to concentrate on a problem is by reducing distraction from the problem. For example, anhedonia, which is often associated with depression, decreases an individual's desire to participate in activities that provide short-term rewards, and instead, allows the individual to concentrate on long-term goals. In addition,

"psychomotor changes," such as solitariness, decreased appetite, and insomnia also reduce distractions. For instance, insomnia enables conscious analysis of the problem to be maintained by preventing sleep from disrupting such processes. Likewise, solitariness, lack of physical activity, and lack of appetite all eliminate sources of distraction, such as social interactions, navigation through the environment, and "oral activity," which disrupt stimuli from being processed.

### **Social risk hypothesis**

This hypothesis explains the evolutionary origin of depression in the ancestral context in which depression was an adaptation that enabled an individual to maintain social ties critical for survival and reproduction. During the Pleistocene period, for instance, such social ties were vital in food foraging and protection from predators.

Depression, resulting from one's loss of "Social Attention Holding Power," or SAHP, may have signalled the individual's submissiveness to the more dominant males of the social group through associated symptoms, such as low confidence and anxiety. This, in turn, reduced tension among group members, and enabled bonds to be maintained. Secondly, depression may also have served to signal other members of an individual's need for aid and desire to reform lost bonds.

### **Behavioral shutdown model**

If an organism faces more risk or expenditure than reward from activities, the best evolutionary strategy may be to withdraw from them. The behavioral shutdown model proposes that emotional pain, like physical pain, serves a useful adaptive purpose. Negative emotions like disappointment, sadness, grief, fear, anxiety, anger, and guilt are described as "evolved strategies that allow for the identification and avoidance of specific problems, especially in the social domain." Depression is characteristically associated with anhedonia and lack of energy, and those experiencing it are risk-averse and perceive more negative and pessimistic outcomes because they are focused on preventing further loss. Although the model views depression as an adaptive response, it does not suggest that it is beneficial by the standards of current society; but it does suggest that many approaches to depression treat symptoms rather than causes, and underlying social problems need to be addressed.

### **Possibilities of depression as a dysregulated adaptation**

Depression, especially in the modern context, may not necessarily be adaptive. The ability to feel pain, have diarrhea, and experience depression, are adaptive defense mechanisms, but when they are "too easily triggered, too intense, or long lasting," they can become "dysregulated." In such a case, defense mechanisms, too, can become diseases, such as "chronic pain or dehydration from

diarrhea." Depression, which may be a similar kind of defense mechanism, may have become dysregulated as well.

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