

# **Love's labour's lost**

## **Depression as an evolutionary adaptation to obtain help from those with whom one is in conflict**

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Many agonizing experiences like physical pain and nausea are adaptations—functional aspects of human psychology that evolved by natural selection. This observation has led many evolutionary researchers to propose that sadness and depressed mood may similarly be adaptations.<sup>1</sup> Yet, because symptoms like loss of interest in virtually all activities and suicidality seem to serve no useful function, these researchers have discounted the possibility that full-blown Major Depressive Disorder (MDD) might be an adaptation.

Though it appears to be all cost and no benefit, we propose that MDD is actually a psychological adaptation engineered by natural selection to help individuals resolve complex, socially-imposed stresses that could affect long-term fitness by (1) convincingly signaling need and (2) compelling help from reluctant others. In short, we hypothesize that MDD's debilitating symptoms—it's "costs"—elicit compensating benefits.<sup>2,3,4</sup>

Our adaptationist orientation does not inexorably lead to this conclusion, though it certainly fuels our interest. MDD could instead be a dysfunction of a psychological adaptation like sadness.<sup>1</sup> But the only way to determine that it is not adaptive is to consider and test adaptationist alternatives, and we propose this one.

## Proposed selection pressure for MDD

In the environment of evolutionary adaptedness (EEA),<sup>†</sup> a person suffering a major negative life event frequently needed help from social partners. Such events might have included death of a spouse, a relationship gone bad, or a failed project that degraded socioeconomic standing or reputation. But when there were conflicts of interest between the individual in need of help and the group, assistance may not have been forthcoming. A strategy to compel group members to provide help would have resulted in fitness benefits for individuals in need.

## The adaptation

In the EEA, individual fitness depended critically on fellow group members. Among contemporary hunter-gatherers, for example, most groups depend on a few good hunters for meat; loss of one can place small groups in jeopardy.<sup>5</sup> One individual can affect the welfare of many group members by withholding or jeopardizing the benefits he or she provides them, thereby motivating the group to make changes benefiting the individual that they might otherwise not be inclined to make. MDD, we propose, is a psychological adaptation that evolved to do just that.

Making major concurrent changes to an individual's relationships with multiple group members was no doubt a formidable problem over human evolutionary history because group members could not be sure that such changes would make things better and not worse for themselves. They should therefore have been biased to resist them. By simultaneously imposing costs on all group members, MDD would have been an effective strategy for overcoming broadly based social resistance. The acute dysfunction

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<sup>†</sup> The EEA refers to those aspects of the ancestral environment that were relevant to the evolution, development, and functioning of an organism's adaptations. Contrary to popular conception, the current environment is *broadly similar* to the EEA, otherwise humans would rapidly be going extinct.

caused by MDD can motivate diverse individuals whose own livelihoods depend on the depressed person (e.g., family, friends, colleagues) to support change, because it (1) broadcasts a costly and thus honest signal of need<sup>6</sup> and (2) exerts an extortionary force on interdependent individuals.

MDD often causes negative reactions in family and friends,<sup>7</sup> we propose, precisely because it results in withdrawal of services as a strategy to manipulate them. The depressive's genuine lack of conscious *intent*, however, may minimize others' anger at feeling manipulated. The costs of MDD symptoms, rather than being pathological, are incurred in an unconsciously calculated gamble to gain greater long-term benefits.

## **Suicide**

In the EEA, it may have been adaptive for elderly or infirm individuals who burdened their groups to kill themselves.<sup>8</sup> This does not account, however, for today's glut of healthy, potentially productive people who attempt suicide, which is among the three leading causes of death for people aged 15-34 years.<sup>9</sup>

If such individuals were to kill themselves before reproducing, without warning, or were to choose 100% reliable methods, then suicidality would best be viewed as pathology. But that isn't the case. In depression-related suicidality, individuals commonly warn others of their intentions and frequently choose unreliable methods, avoiding death. In the EEA, suicide threats would have been an effective strategy to signal to group members that the benefits they were receiving from the suicidal person were at risk. Suicide threats would have allowed the group to respond to the suicidal person's needs, ensuring that individual's continuing contributions to the fitness of others. Under these circumstances, the average benefits received over many generations by genes coding for this strategy could exceed the average costs suffered by those genes when suicide attempts succeeded.

On this view, suicidality is simply an escalated version of both the honest signaling and the extortionary bargaining strategies we propose for MDD, a theoretical unification that would explain the close association of suicidality and MDD. Our theory is in accord with the common perception that depression and suicidality are "cries for help."<sup>10</sup>

Many traditional societies accept that depressive symptoms, especially suicide threats, are caused by conflicts between individuals and groups. Redressing individual grievances is understood to be the goal of these symptoms.<sup>4</sup>

## **Greater incidence of MDD in Women**

Many more women than men suffer MDD.<sup>9</sup> An important test of any model of MDD is its ability to explain this. Under our hypothesis, reasons include:

- Physical aggression as a means to resolve conflicts has been more costly for women than men; MDD would have been a safer though slower strategy for women to resolve conflicts between themselves and the group.
- Women have more often been victims of social manipulation: (1) Ethnographically, because married women traditionally resided with their husband's relatives rather than their own, women generally experienced more within-group conflict than men.<sup>11</sup> (2) Female reproductive capacity is scarce compared to that of males, making them worth the effort to control.

- Changing the more interconnected, egalitarian social networks characterizing women required simultaneously applying pressure on more social partners than did changing the relatively linear hierarchies characterizing men.<sup>11</sup> MDD simultaneously applies pressure on all social partners, and was thus more useful to women.

## Testing the hypothesis

In naturalistic, interdependent social settings, MDD must be shown (1) to trigger when individuals are in need but have conflicts with important others, and (2) be reasonably effective in causing those important others to provide assistance or make necessary social changes that provide long-term benefits to the depressed person.

Important facts about depression	How our model explains them
Major negative life events appear to be a cause of depression. <sup>12</sup>	Individuals suffering a major negative life event are likely to need help from others.
Depression causes a negative reaction in others. <sup>7</sup>	Depression evolved to compel assistance from reluctant social partners, who understandably resent the manipulative strategy of having benefits withheld.
Interpersonal conflict has often been implicated in depression; <sup>12</sup> “Locus-of-control” and helplessness/hopelessness constructs emphasize conflicts with powerful others, and have a robust association with depression. <sup>13</sup>	Social conflicts between the sufferer and others prevent help from being freely given. Depression functions, in part, to compel social assistance and needed social change in the face of such impediments to social success.
“Entrapment” is a frequently noted aspect of depressive episodes. <sup>14</sup>	Individuals only use the depression strategy when they feel they cannot act unilaterally.
Depression is strongly associated with objective measures of low productivity. <sup>9</sup>	Depression signals need and compels social assistance by preventing the sufferer from providing benefits to others.
Despite negative reactions to depressed individuals, depressive symptoms have been shown to elicit help and support in naturally occurring as well as laboratory situations <sup>15</sup> .	Depression evolved to elicit social benefits such as increased investment and/or willingness of important others to consider alternative social arrangements. We do not predict that family and friends will necessarily invest or change willingly (although final outcomes may, in some cases, be better for all).
Postpartum depression.	That others depend on the individual for critical services or resources (or would have, in the EEA) is a necessary condition for depression. In the EEA, raising a newborn was difficult if not impossible without the mother. Postpartum depression, which hinders mothers from caring for newborns, may function to compel more support when it is needed. <sup>2</sup>
Increased social support and positive life changes are predictors of remission of depression. <sup>16</sup>	Sufficiently increased benefits <i>that are perceived as valuable by the depressed individual</i> should cause depression to remit. Our hypothesis suggests that effective social support may often entail new kinds of risky investments by social partners, especially if major social change is needed.

A female bias in rates of depression is well documented cross-culturally. <sup>9</sup> Women appear to be neurochemically primed to move into MDD sooner under prolonged stress than men. <sup>17</sup>	Women should have a lower threshold for, and higher rates of, depression than men (see text).
The neurobiology of depression is closely associated with stress hormones and the HPA axis. <sup>18</sup>	Conflicts with social partners when one is in need should cause chronic stress, which should trigger depression.
Depression symptoms appear to be a human universal. <sup>19</sup>	Psychological adaptations should be universal (though not always expressed) in the species.

Table 1: How our model explains some important facts about depression.

The best models for predicting MDD only account for about 50% of the variance in its incidence.<sup>20</sup> Our hypothesis suggests new MDD predictors for investigation. We believe that reproductive fitness is reduced not only by major negative life events like losing a mate, but by social arrangements and customs that stifle fitness for some individuals. An important example in traditional societies would be an arranged marriage to an undesirable mate, and in secular states, family pressure to choose an unappealing career. Addressing the latter problems requires more than increased status-quo forms of help from others; it requires forging major changes in one's "social niche" - a person's essential socioeconomic and political *modus operandi*.

Our analysis of MDD recognizes that each person's social niche, both in the EEA and today, is both defined and *constrained* by a matrix of complexly interacting social contracts. MDD would have been an ideal strategy to compel an interdependent social group to make major changes benefiting a single member. We predict that the MDD treatment that may most reliably increase long-term quality of life will include changes that help an individual achieve her genuine potential for social success.

## Clinical applications

Our hypothesis suggests that when one's usual labors run aground, depression leverages one's value to others to overcome social barriers to future success.

Depression's communicative and extortionary powers depend on the interdependence of the depressed person and group members. Today, many people live in large, anonymous cities, often far from families and close-knit support groups. People have jobs and even marriages where they can be more easily replaced than in the human EEA.\*

The intensity and incidence of MDD may be increasing<sup>9</sup> to overcome the weaker inter-individual fitness ties of modern societies. Moreover, unprecedented, ultra-lethal means of self-harm such as firearms can turn a cry for help into an evolutionarily unintended last request.

Medicine accepts that treating symptoms alone is a stopgap; identifying the underlying etiology, and treating with that in mind, is far preferable. As medicine develops ever more powerful tools to ameliorate psychological pain and dampen

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\* MDD is expected to activate and function properly in any social context in which individuals are highly inter-dependent yet there are conflicts of interest. Such conditions likely characterized the EEA, and are still frequently encountered today in social arenas ranging from the modern nuclear family to corporate management.

unwanted emotional changes, it becomes increasingly important to investigate adaptive psychosocial functions that might be sacrificed in the process. This allows doctors and patients to weigh the costs and benefits of interventions more effectively.

Because MDD produces pain, dramatic dysfunction, and death, the research and practice communities understandably view it as a disease. But a Darwinian analysis reveals a potentially elegant design and a purpose that can still be useful. If MDD is an evolved adaptation that uses pain and incapacitation to communicate real needs and, where required, to compel support, then some current treatments, such as drug therapy alone, are likely insufficient.

We believe that the adaptationist hypothesis directs new research and supports multiple treatment modalities, and would encourage physicians to inquire about a patient's social conflicts and become tenacious advocates for their resolution.

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