# The Evolution of Happiness

David M. Buss
*University of Texas at Austin*

*An evolutionary perspective offers novel insights into some major obstacles to achieving happiness. Impediments include large discrepancies between modern and ancestral environments, the existence of evolved mechanisms "designed" to produce subjective distress, and the fact that evolution by selection has produced competitive mechanisms that function to benefit one person at the expense of others. On the positive side, people also possess evolved mechanisms that produce deep sources of happiness: those for mating bonds, deep friendship, close kinship, and cooperative coalitions. Understanding these psychological mechanisms—the selective processes that designed them, their evolved functions, and the contexts governing their activation—offers the best hope for holding some evolved mechanisms in check and selectively activating others to produce an overall increment in human happiness.*

Happiness is a common goal toward which people strive, but for many it remains frustratingly out of reach. An evolutionary psychological perspective offers unique insights into some vexing barriers to achieving happiness and consequently into creating conditions for improving the quality of human life. These insights are based on a deeper understanding of the human mind, how the selective process designed it, and the nature of the evolved functions of its component parts.

Current mechanisms of mind are the end products of a selective process, a sieve through which features passed because they contributed, either directly or indirectly, to reproductive success. All living humans are evolutionary success stories. They each have inherited the mechanisms of mind and body that led to their ancestors' achievements in producing descendants. If any one of their ancestors had failed along the way to survive, mate, reproduce, and solve a host of tributary adaptive problems, they would not have become ancestors. As their descendants, people hold in their possession magical keys—the adaptive mechanisms that led to their ancestors' success.

What evolved psychological mechanisms do humans possess, how are they designed, and what functions were they designed to carry out? At this point in evolutionary psychological science, psychologists can provide only a few provisional answers. This article offers several reflections on these issues, grounded in recent conceptual and empirical advances, with the explicit acknowledgment of their tentative and interim nature. The article starts by examining some impediments to happiness and then offers suggestions for how these obstacles might be overcome.

## Barriers to Improving Quality of Life

An evolutionary analysis leads to several key insights about barriers that must be overcome to improve the quality of human life. These include discrepancies between modern and ancestral environments, evolved mechanisms that lead to subjective distress, and the fact that selection has produced competitive mechanisms.

### Discrepancies Between Modern and Ancestral Environments

Modern living has brought a bounty of benefits to present day humans. Medical technology has reduced infant mortality in many parts of the world to a fraction of what it undoubtedly was in ancestral times. People have the tools to prevent many diseases that afflicted their Stone Age forebears and to ameliorate the distressing symptoms of many others. The psychological pain of depression and anxiety can be reduced with lithium, Prozac, and other psychotropic drugs. Modern technology gives people the power to prevent the pain inflicted by extremes of cold and heat, food shortages, some parasites, most predators, and other Darwinian (1859) "hostile forces of nature." In many ways, people live in astonishing comfort compared with their ancestors.

At the same time, modern environments have produced a variety of ills, many unanticipated and only now being discovered. Although people have the tools and technology to combat food shortages, they now vastly overconsume quantities of animal fat and processed sugars in ways that lead to clogged arteries, heart disease, diabetes, and other medical ailments (Nesse & Williams, 1994; Symons, 1987). Depletion of the ozone layer may lead to skin cancer at rates that were unlikely to have afflicted their ancestors. The ability to synthesize drugs has led to heroin addiction, cocaine abuse, and addiction to a variety of prescription drugs.

Evolutionary psychological analysis suggests several other ways in which modern psychological environments cause damage. Consider the estimate that humans evolved in the context of small groups, consisting of perhaps 50 to 200 individuals (Dunbar, 1993). Modern humans, in contrast, typically live in a massive urban metropolis sur-

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Correspondence concerning this article should be addressed to David M. Buss, Department of Psychology, University of Texas, Austin, TX 78712. Electronic mail may be sent to dbuss@psy.utexas.edu.



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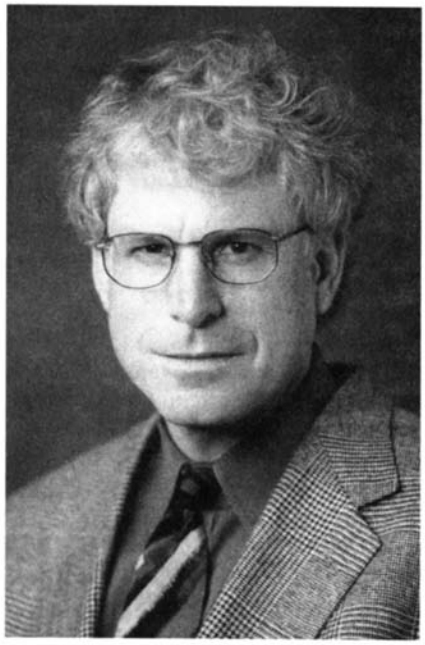

**David M. Buss**

rounded by thousands or millions of other humans. Ancestral humans may have had a dozen or two potential mates to choose from. Modern humans, in contrast, are surrounded by thousands of potential mates. They are bombarded by media images of attractive models on a scale that has no historical precedent and that may lead to unreasonable expectations about the quality and quantity of available mates. Ancestral humans lived in extended kin networks, surrounded by genetic relatives such as uncles and aunts, nephews and nieces, cousins and grandparents. Modern humans typically live in isolated nuclear families often devoid of extended kin. Ancestral humans relied on their friends and relatives to seek justice, to correct social wrongs, to deal with violence inflicted on them from others. Modern humans rely on hired police and a legal system whose labyrinth makes the horror of Kafka's *The Trial* look like a tea party.[1] It is reasonable to speculate that these large discrepancies between ancestral and modern environments create unanticipated psychological problems and reduce the quality of life.

Some empirical evidence supports this proposition. The modern barrage of attractive images of other humans provides an instructive example. The evolutionary psychologist Doug Kenrick and his colleagues have provided evidence that these images may create psychological and social problems. In a series of studies on contrast effects, they discovered that men exposed to multiple images of attractive women subsequently rated their commitment to their regular partner as lower, compared with men exposed to average looking women (Kenrick, Gutierres, & Goldberg, 1989; Kenrick, Neuberg, Zierk, & Krones, 1994). Women exposed to multiple images of dominant, high-status men showed a similar decrement in commitment to and love of their regular partner, compared with women exposed repeatedly to less dominant men. These sex-linked contrast effects were precisely predicted by Kenrick's evolutionary psychological framework.

Repeated exposures apparently affect self-concept as well. Women subjected to successive images of other women who are unusually attractive subsequently feel less attractive themselves, showing a decrease in self-esteem (Gutierres, Kenrick, & Partch, 1999). Men exposed to descriptions of highly dominant and influential men show an analogous diminution in self-concept. These effects are sex-linked in ways precisely predicted by evolutionary psychological hypotheses. The effects suggest that the discrepancy between modern and ancestral environments in exposure to media images may lead to dissatisfactions with current partners and reductions in self-esteem. They may interfere with the quality of close relationships and hence with the quality of life.

A second example is more speculative. Depression is one of the most common psychological maladies of modern humans, and it afflicts roughly twice as many women as men (Nolen-Hoeksema, 1987). There is some evidence that rates of depression are increasing in modern life. Five studies comprised of 39,000 individuals living in five different areas of the world revealed that young people are more likely than older people to have experienced at least one major episode of depression (Nesse & Williams, 1994, p. 220). Moreover, the incidence of depression appears to be higher in more economically developed cultures (Nesse & Williams, 1994). Why would rates of depression be rising in modern environments, despite the greater abundance of creature comforts and the presence of technological solutions to former ancestral maladies of life?

Nesse and Williams (1994) offer one hypothesis:

> Mass communications, especially television and movies, effectively make us all one competitive group even as they destroy our more intimate social networks. . . . In the ancestral environment you would have had a good chance at being the best at something. Even if you were not the best, your group would likely value your skills. Now we all compete with those who are the best in the world. Watching these successful people on television arouses envy. Envy probably was useful to motivate our ancestors to strive for what others could obtain. Now few of us can achieve the goals envy sets for us, and none of us can attain the fantasy lives we see on television. (Nesse & Williams, 1994, p. 220).

According to this analysis, the increase in depression stems from self-perceived failures resulting in erroneous comparisons between people's lives and the lives they see depicted so glamorously in the media.

A related explanation of an increase in depression invokes the fact that modern living conditions of relative anonymity and isolated nuclear families deprive people of the intimate social support that would have characterized ancestral social conditions (Nesse & Williams, 1994, p.

[1] The American legal system, of course, carries many blessings as well. It probably prevents or lowers the incidence of certain types of homicide, such as blood feuds, that are prevalent in many tribal societies and cultures lacking third-party legal systems (see Chagnon, 1992; Keeley, 1996).

221). In modern America, for example, kin members often scatter in the pursuit of better jobs and promotions, yielding a social mobility that removes the social support of extended kin and makes social bonds more transient. If psychological well-being is linked with having deep intimate contacts, being a valued member of an enduring social group, and being enmeshed in a network of extended kin, then the conditions of modern living seem designed to interfere with human happiness.

These are just a few examples that suggest that some discrepancies between modern and ancestral conditions impede a high quality of life. Other possibilities include the lack of critical incidents by which people might establish true friendships (Tooby & Cosmides, 1996), the sense of powerlessness modern humans feel in large anonymous organizations compared with the small social hierarchies of the past (Wenegrat, 1990), and the increased opportunities for casual sex lacking in deep intimacy, that might lead people to feel emotionally empty (Buss, 1994). These discrepancies between modern and ancestral environments may interfere with the quest for a high quality of life.

### Adaptations That Cause Subjective Distress

A second impediment to human happiness is that people have evolved an array of psychological mechanisms that are "designed" to cause subjective distress under some circumstances (e.g. Seligman, 1971). These include psychological pain (Thornhill & Thornhill, 1989), varieties of anxiety (Marks & Nesse, 1994), depression (Price & Sloman, 1987), specific fears and phobias (Marks, 1987), jealousy (Daly, Wilson, & Weghorst, 1982; Symons, 1979), and specific forms of anger and upset (Buss, 1989). These are all proposed to be evolved psychological mechanisms designed to solve specific adaptive problems, such as sexual coercion (psychological pain), inhabiting a subordinate position in the social hierarchy (depression), spousal infidelity (jealousy), and strategic interference (anger).[2] If these hypotheses are correct, they suggest that part of the operation of the normal psychological machinery *inevitably* entails experiencing psychological distress in certain contexts.

The emotion of jealousy provides an illustration. Much empirical evidence supports the hypothesis that sexual jealousy is an evolved psychological mechanism designed to combat the adaptive problem of threat to valued long-term mateships (Daly et al., 1982; Symons, 1979). Jealousy, according to this hypothesis, functions to alert a person to a mate's possible or actual infidelity and motivates action designed to prevent infidelity or deal with defection. Its design features include sex-linked activators, with men becoming more jealous in response to the threat of sexual infidelity and women becoming more jealous in response to emotional infidelity—hypotheses supported by psychological, physiological, and cross-cultural data (Buss et al., 1999; Buss, Larsen, Westen, & Semmelroth, 1992; Buunk, Angleitner, Oubaid, & Buss, 1996; Daly et al., 1982; Geary, Rumsey, Bow-Thomas, & Hoard, 1995; Wiederman & Allgeier, 1993).

Subjectively, jealousy is typically an extremely distressing emotion, a passion dangerous to the self and to others (Buss, 2000). It can create the torment of sleepless nights, cause a person to question his or her worth as a mate, create anxiety about losing a partner, and play havoc with social reputation. Jealousy can lead to an obsessive vigilance that crowds out all other thoughts and to terrifying violence that threatens the safety and well-being of the partner.

Despite the manifold unhappiness jealousy creates, jealousy has a crystalline functional logic, precise purposes, and supreme sensibility. It exists today in modern humans because those in the evolutionary past who were indifferent to the sexual contact that their mates had with others lost the evolutionary contest to those who became jealous. As the descendants of successful ancestors, modern humans carry with them the passions that led to their forebears' success. The legacy of this success is a dangerous passion that creates unhappiness, but the unhappiness motivated adaptive action over human evolutionary history (Buss, 2000).

Anger and upset, according to one evolutionary psychological hypothesis, are evolved psychological mechanisms designed to prevent *strategic interference* (Buss, 1989). These negative emotions function to draw attention to the interfering event, alert a person to the source of strategic interference, mark the interfering events for storage in and retrieval from memory, and motivate action designed to eliminate the interference or to avoid subsequent interfering events. Because men and women over evolutionary time have faced different sources of strategic interference, they are hypothesized to get angry and upset about different sorts of events. Empirical evidence supports these hypotheses, suggesting that women get more upset about sexual aggression (Buss, 1989), various forms of sexual harassment (Studd, 1996), and the horror of rape (Thornhill & Thornhill, 1989). Men, in contrast, tend to respond with more anger and upset than women when a potential mate leads them on or a current partner withholds sex (Buss, 1989). These and many other findings support the hypothesis that many apparently negative emotions may in fact be quite functional for humans, helping them to solve adaptive problems of social living (see Buss, 2000). Nonetheless, the subjective experience can be extremely painful and disturbing, reducing the quality of life a person experiences.

The negative emotions are not limited to sexual skirmishing. People experience distress when someone blocks their ascension in the social hierarchy, when they suffer a slide in status, when a friend betrays them, when their coalition is weakened, when their team loses, when their health is impaired, when they are threatened with violence, when a sibling is favored over them by a parent, when they are victimized by malicious gossip, when a partner rejects them, when tragedy befalls a loved one, and when a child

[2] Strategic interference occurs when a person's goals, or methods of achieving goals, are impeded or blocked (Buss, 1989).

dies. Human anguish in modern minds is tethered to the events that would have caused fitness failure in ancestral times.

### Adaptations Designed for Competition

A third impediment to happiness stems from the competition inherent to evolution by selection. Reproductive *differentials* caused by design differences make up the engine of evolutionary change. Selection operates on differences, so one person's gain is often another person's loss. As Symons (1979) observed, "the most fundamental, most universal double standard is not male versus female but each individual human versus everyone else" (p. 229). The profound implication of this analysis is that humans have evolved psychological mechanisms designed to inflict costs on others, to gain advantage at the expense of others, to delight in the downfall of others, and to envy those who are more successful at achieving the goals toward which they aspire.

The evolutionary psychologist Steven Pinker provided an example using the German word *Schadenfreude,* a word that appears not to have a direct counterpart in the English language. Nonetheless,

> When English speakers hear the word *Schadenfreude* for the first time, their reaction is not "Let me see . . . Pleasure in another's misfortunes . . . What could that possibly be? I cannot grasp the concept; my language and culture have not provided me with such a category." Their reaction is, "You mean there's a *word* for it? Cool!" (Pinker, 1997, p. 367; italics in original)

Ambrose Bierce even defined happiness as "an agreeable sensation arising from contemplating the misery of others" (quoted in Pinker, 1997, p. 390).

Empirical evidence supports the hypothesis that people do take pleasure in the "downfall of tall poppies" (Feather, 1994, p. 2). Across a series of studies, Feather (1994) discovered several important conditions under which people take pleasure in the fall of tall poppies. First, when the high status of a tall poppy was made salient, participants reported more happiness with the other's fall from grace. Second, when the success of a tall poppy was not perceived to be deserved, participants reported more pleasure with his or her fall than when the tall poppy was perceived to deserve the initial success. Third, *envy* was the most common emotional experience participants felt toward a tall poppy, especially if the other person's success was in a domain important to the participant, such as academic achievement among students.

Do people have adaptations to feel especially good about themselves when superseding or subordinating others (Gilbert, 1989)? Are envy and depression reliable consequences of being relatively low in the social hierarchy (Gilbert, 1989; Price & Sloman, 1987)? Given the apparent universality of status hierarchies in all groups and all cultures worldwide, escape from relative ranking may prove exceedingly difficult. If a person's happiness depends in part on another's misery or failure, then how can people design lives to improve the quality of all, not just those who happen to get ahead? These vexing questions become salient with the recognition that evolution has produced some psychological mechanisms that are inherently competitive.

Because *differential* reproductive success is the engine of the evolutionary process, one person's gain is often another person's loss. Consider two women competing to attract a particular desirable man as a husband. Research has shown that in addition to various self-enhancing attraction tactics, women also derogate their rivals (Buss & Dedden, 1990; Schmitt & Buss, 1996). Some women will call a rival promiscuous, spread rumors about how easy she is to get into bed, denigrate aspects of her face, body, and clothing style, and sometimes falsely tell others that she has contracted a sexually transmitted disease. Men are no less vicious in their derogation tactics. The content of gossip, in short, is adaptively targeted and undoubtedly affects success on the mating market. It can simultaneously create psychological anguish and ruin the reputations of victims. The outcome is inherently competitive—one person's success on the mating market is typically another person's loss. As Gore Vidal noted, "It is not enough to succeed. Others must fail" (quoted in Pinker, 1997, p. 390).

Some psychological mechanisms also produce predictable forms of conflict between the sexes. Men's evolved desire for sexual variety, for example, sometimes prompts sexual overtures that are sooner, more persistent, and more aggressive than women want (Buss, 1994). Simultaneously, women's strategies of imposing a longer courtship delay, requiring signs of emotional involvement, and delaying sex interfere with men's short-term sexual strategy (Buss, 1994). Both sexes deceive each other in ways well predicted by evolutionary theories (e.g., Tooke & Camire, 1991).

Jealousy provides another instructive example of competition and conflict (Buss, 2000). Jealousy is activated by perceived or real threats to romantic relationships—by a rival who is encroaching, a partner who is threatening defection, or both. Jealousy can undermine self-esteem, making a person feel "hurt, threatened, broken hearted, upset, insecure, betrayed, rejected, angry, possessive, envious, unhappy, confused, frustrated, lonely, depressed, resentful, scared, and paranoid" (Buss, 2000). Jealousy motivates conflict with partners, fights with rivals, and in some cases extreme violence. Despite the extensive suffering it creates, it served our ancestors well in the competitive currency of reproduction. Nonjealous men risked being cuckolded and spending a life devoted to nurturing a rival's children. Nonjealous women risked the diversion or loss of a partner's commitment to a female rival. Jealousy evolved to serve a variety of functions, including deterring a mate from straying, backing off interested rivals, and perhaps even communicating commitment to a partner (Buss, 2000). These competitive functions have come at the cost of conflict.

### Three Additional Evolutionary Tragedies of Happiness

These various obstacles to improving human happiness obviously do not exhaust the evolved impediments to well-being. Evolutionary psychologist Steven Pinker (1997) de-

scribed several other tragedies of happiness. One is the fact that humans seem designed to adapt quickly to their circumstances, putting us on a "hedonic treadmill" (Diener, Suh, Lucas, & Smith, 1999, p. 286). Americans today have more cars, color TVs, computers, and brand-name clothes than they did several decades ago, but Americans are no happier now than they were then (Myers & Diener, 1995). Reports of lottery winners suggest that individuals quickly adjust to their new riches and may be no happier than they were before (some even report increased conflicts with others). Happiness may track modern manifestations of ancestral signals of evolutionary fitness (Ketelaar, 1995), but people seem to adjust quickly to any gains they experience, creating the hedonic treadmill where apparent increments in rewards fail to produce sustained increments in personal happiness.

A second tragedy of human unhappiness stems from the fact that evolved mechanisms are designed to function well on average, although they will necessarily fail in some instances—what may be called *instance failure* (Cosmides & Tooby, 1999). For example, mechanisms of mate guarding are designed to ward off rivals and keep a partner from straying (Buss & Shackelford, 1997). Presumably, mate-guarding mechanisms evolved because, on average, they succeeded in successful mate retention. An individual woman or man, however, might fail to keep a partner, thus producing a cascade of psychological anguish and social humiliation, even though mate-guarding mechanisms have succeeded on average over the relevant sample space of evolutionary time. Instance failures may even be more frequent than successes over evolutionary time, as long as the net benefit of the strategy has exceeded its costs.

A third tragedy of human emotions is the asymmetry in affective experience following comparable gains and losses (Kahneman & Tversky, 1984). The pain people experience when they lose $100, for example, turns out to be affectively more disagreeable than the pleasure they experience when they win $100. Losses sting more keenly; the joy produced by comparable gains is more muted. As the former tennis star Jimmy Connors observed, "I hate to lose more than I like to win" (cited by Ketelaar, 1995). Evolved emotions, in short, may have been well designed to keep people's ancestors on track in the currency of fitness, but in some ways they seem designed to foil people's efforts to promote long-term happiness.

## Improving Human Happiness

Given the obstacles to well-being—discrepancies between modern and ancestral environments, evolved emotional mechanisms designed to cause subjective distress, and the existence of psychological mechanisms that are inherently competitive—it is clear that an evolutionary perspective does not offer easy or facile solutions to the problems of improving psychological well-being and the quality of life. In fact, they reveal how difficult such solutions will be to achieve. Nonetheless, evolutionary psychology does provide insights into how some of the more unpleasant and damaging features of the human condition might be ameliorated.

### Closing the Gap Between Modern and Ancestral Conditions

Modern humans cannot go back in time and live the lives of their Stone Age forebears, nor would an uninformed or uncritical move in that direction be inherently desirable, given that modern technology has eliminated many of the hostile forces of nature that formerly made life brutish, painful, and short. Nonetheless, the gap between former and modern conditions might be closed on some dimensions to good effect.

***Increase closeness of extended kin.*** If being deprived of extended close kin leads to depression in modern environments (L. Cosmides, personal communication, September 17, 1989), individuals can take steps to remain in closer proximity or to maintain greater emotional closeness to existing kin. Modern electronic communication, including E-mail, telephone, and video conferencing, might be exploited to this end when physical proximity is not possible. With people living longer, opportunities to interact with grandparents and grandchildren expand, offering the possibility of strengthening the network of extended kin.

***Develop deep friendships.*** According to Tooby and Cosmides (1996), people may suffer a dearth of deep friendships in modern urban living. It's easy to be someone's friend when times are good. It's when you are really in trouble that you find out who your true friends are. Everyone has experienced fair-weather friends who are there only when times are good, but finding a true friend, someone that you know you can rely on when the going gets tough, is a real treasure.

The problem is that when times are good, fair-weather friends and true friends may act pretty much alike. It's difficult to know who your true friends are when the sailing is smooth. Because fair-weather friends can mimic true friends, the adaptive problem is how to differentiate those who are deeply engaged in your welfare from those who will disappear during your time of deep need (Tooby & Cosmides, 1996). Selection should fashion assessment mechanisms to make these differentiations. The strongest tests, the most reliable sources of evidence of friendship, come from the help you receive when you are desperately in need. Receiving help during these times is a far more reliable litmus test than help received at any other time. Intuitively, people do seem to have special recall for precisely these times. People take pains to express their appreciation, communicating that they will never forget the sacrifices made by those who helped them in their darkest hour.

Modern living, however, creates a paradox (Tooby & Cosmides, 1996). Humans generally act to avoid episodes of treacherous personal trouble, and in modern living, many of the hostile forces of nature that would have put people in jeopardy have been harnessed or controlled. Laws deter stealing, assault, and murder. A police force performs many of the functions previously performed by

friends. Medical science has eliminated or reduced many sources of disease and illness. People live in an environment that in many ways is safer and more stable than the environment inhabited by their ancestors. Paradoxically, therefore, people suffer from a relative scarcity of *critical events* that would allow them to accurately assess who is deeply engaged in their welfare and to differentiate them from fair-weather friends. The loneliness and sense of alienation that many feel in modern living, a lack of a feeling of deep social connections despite the presence of many seemingly warm and friendly interactions, may stem from the lack of critical assessment events that tell them who is deeply engaged in their welfare (Tooby & Cosmides, 1996).

Several strategies may help to close this gap between modern and ancestral conditions to deepen social connectedness (Tooby & Cosmides, 1996). First, people should promote reputations that highlight their unique or exceptional attributes. Second, they should be motivated to recognize personal attributes that others value but have difficulty getting from other people. This involves cultivating a sensitivity to the values held by others. Third, they should acquire specialized skills that increase irreplaceability. If people develop expertise or proficiency in domains that most others lack, they become indispensable to those who value those competencies. Fourth, they should preferentially seek out groups that most strongly value what they have to offer and what others in the group tend to lack; in short, they should find groups in which their assets will be most highly cherished. Fifth, they should avoid social groups where their unique attributes are not valued or where these qualities are easily provided by others.

A sixth strategy involves the imposition of *critical tests* designed to deepen the friendship and test the strength of the bond (see also Zahavi, 1977; Zahavi & Zahavi, 1997). Although it would be foolish to subject oneself to a life-or-death situation merely to test the strength of a friendship, more modest tests are possible. Some friends may fail the tests, in which case they are deemed fair-weather friends. Those who pass the tests and provide help during these critical times make the transition to true friends marked by deep engagement.

### Reducing Subjective Distress

If humans have evolved psychological mechanisms that function to produce subjective distress, one can design a social environment to reduce the likelihood of facing the adaptive problems that trigger psychological anguish. Although these problems are probably impossible to avoid completely, several strategies might lower the likelihood of their occurrence.

***Selecting a mate who is similar—Reducing jealousy and infidelity.*** One strategy is to select a long-term mate or marriage partner who is similar to you on dimensions such as values, interests, politics, personality, and overall "mate value." A large body of empirical evidence supports the hypothesis that discrepancies between partners in these qualities lead to increased risk of infidelity, instability of the relationship, and a higher likelihood of eventual breakup (Buss, 2000; Hill, Rubin, & Peplau, 1976; Kenrick & Keefe, 1992; Thiessen & Gregg, 1980; Walster, Traupmann, & Walster, 1978; Whyte, 1990). Selecting a mate who is similar, conversely, should lower the likelihood of infidelity, and hence the agony experienced as a result of jealousy. Because jealousy appears to be an evolved emotion designed to combat threats to relationships, anything that reduces its activation should reduce the subjective pain people experience (Buss, 2000). Furthermore, assortative mating decreases the chance of divorce, and hence the sequelae caused by divorce—anguish experienced by the parties involved as well as by any children from the union.

Anything that leads to a higher divorce probability increases the odds of creating stepchildren. Evolutionary psychologists have demonstrated that stepchildren experience physical abuse and even homicide at rates 40 to 100 times greater than children residing with their genetic parents (Daly & Wilson, 1988). Selecting a mate who is similar lowers the odds of breaking up and hence decreases the odds of producing stepchildren who are at increased risk of abuse.

***Extended kin—Reducing incest, child abuse, and spousal battering.*** Incest, child abuse, and wife battering may be greater now because modern humans live in isolated nuclear families, protected in a shroud of privacy. Having kin in close proximity has been discovered to offer a protective factor against some of these forms of abuse, notably wife battering (Figueredo, 1995). Although no studies have yet been conducted on the protective properties offered by extended kin for incest and child abuse, it is not unreasonable to expect that they will yield a similar effect.

***Education about evolved psychological sex differences.*** Evolutionary psychology offers a precise metatheory about sex differences—the sexes are predicted to differ only in the domains in which they have faced different adaptive problems (Buss, 1995). Many such differences have been documented. Men more than women, for example, infer greater sexual interest when they observe a smile, which may lead to unwanted sexual advances that cause subjective distress in women (Abbey, 1982; Buss, 1994). This male bias in mind reading, however, can be shown to disappear under certain evolutionarily predicted conditions (Haselton & Buss, 2000). Education about the fact that men's and women's minds house somewhat different psychological mechanisms, and that the differences can be deactivated under certain conditions, may help to reduce the frequency of strategic interference.

### Managing Competitive Mechanisms

Perhaps the most difficult challenge posed by our evolved psychological mechanisms is managing competition and hierarchy negotiation, given that selection has fashioned powerful mechanisms that drive rivalry and status striving. Status inequality produces a variety of negative consequences, such as the impairment of health (Wilkinson, 1996). One potential method of reducing such inequalities is to promote cooperation.

Evolutionists have identified one of the key conditions that promote cooperation—shared fate (Sober & Wilson, 1998). Shared fate occurs among genes within a body, for example—when the body dies, all the genes it houses die with it. Genes get selected, in part, for their ability to work cooperatively with other genes. A similar effect occurs with individuals living in some kinds of groups. When the fate of individuals within the group is shared—for example, when the success of a hunt depends on the coordination among all members of the hunting party, or when defense against attack is made successful by the cooperation of a group's members—then cooperation is enhanced. Knowledge of the evolutionary psychology of cooperation can lead to an improved quality of life for all cooperators.

Axelrod (1984), an evolutionary political scientist, suggested several ways in which this can be done. First, enlarge the shadow of the future. If two individuals believe that they will interact frequently in the extended future, they have a greater incentive to cooperate. If people know when the "last move" will occur and that the relationship will end soon, there is a greater incentive for people to defect and not cooperate. Enlarging the shadow of the future can be accomplished by making interactions more frequent and making a commitment to the relationship, which occurs, for example, with wedding vows. Perhaps one reason that divorces are so often ugly, marred by unkind acts of mutual defection, is that both parties perceive the last move and a sharply truncated shadow of the future.

A second strategy that Axelrod (1984) recommends is to teach reciprocity. Promoting reciprocity not only helps people by making others more cooperative, it also makes it more difficult for exploitative strategies to thrive. The larger the number of those who follow a tit-for-tat reciprocity strategy, the less successful it will be to attempt to exploit others by defecting. Essentially, the cooperators will thrive through their interactions with each other, whereas the exploiters will suffer because of a vanishing population of those on whom they can prey.

A third strategy for the promotion of cooperation is to insist on no more than equity. Greed is the downfall of many, exemplified by the myth of King Midas, whose lust for gold backfired when everything he touched, even the food he wanted to eat, turned to gold. The beauty of a tit-for-tat strategy is that it does not insist on getting more than it gives. By promoting equity, tit-for-tat succeeds by eliciting cooperation from others.

A final strategy for promoting cooperation is to cultivate a personal reputation as a reciprocator. People live in a social world where the beliefs others hold about them—their reputations—determine whether others will befriend or avoid them. Reputations are established through people's actions, and word about people's actions spreads. Cultivating a reputation as a reciprocator will make others seek them out for mutual gain. A reputation as an exploiter will foster social shunning. Exploiters risk vengeance and retribution from their victims. The combined effect of these strategies will create a social norm of cooperation, where those who were formerly exploiters are forced to rehabilitate their bad reputations by becoming cooperators themselves. In this way, cooperation will be promoted throughout the group.

By promoting cooperation, some evolved mechanisms designed to yield competitive advantage lie dormant.[3] Humans have within their menu of evolved strategies those that unleash treachery as well as those that produce harmony. By exploiting our knowledge of the conditions that promote cooperation, people might be able to mitigate some of the destruction inflicted by competition.

### The Fulfillment of Desire

A fourth strategy for raising human happiness involves exploiting knowledge of evolved desires (Buss, 2000). Just as humans have evolved adaptations that create subjective distress, they have evolved desires whose fulfillment brings deep joy. Studies of private wishes reveal an evolutionary menu of motivations designed to achieve goals historically correlated with fitness. These include the desire for health, professional success, helping friends and relatives, achieving intimacy, feeling the confidence to succeed, satisfying the taste for high-quality food, securing personal safety, and having the resources to attain all these things (King & Broyles, 1997; Petrie, White, Cameron, & Collins, in press). Success at satisfying these desires brings episodes of deep happiness, even if people might habituate to their constant occurrence.

The fulfillment of mating desires provides another path. One of the most consistent findings in studies of well-being is the link to marriage (Diener et al., 1999). Married women and men are significantly happier than single women and men, even when other variables such as age and income are statistically controlled. Moreover, among married people, those who have succeeded in fulfilling their desire for a spouse who embodies the personality characteristics of agreeableness, conscientiousness, emotional stability, and openness to experience tend to be more emotionally and sexually satisfied with their marriages than those who fail to marry spouses with these qualities (Botwin, Buss, & Shackelford, 1997).

In addition to fulfilling major desires, evolution has equipped people with a host of mechanisms designed to allow people to bathe themselves in aesthetic pleasure. People can design environments to exploit evolved affective mechanisms that signal adaptive affordances. Landscape preferences provide a perfect illustration (Kaplan, 1992; Orians & Heerwagen, 1992). Research supports the hypothesis that humans have evolved specific habitat preferences that mimic certain aspects of the ancestral savanna terrain. People like natural over human-made environments, habitats with running water and terrain to house game. They like places where they can see without being seen (a "womb with a view"). They like environments that provide resources and safety, prospect and refuge, lush vegetation and fresh fruit. As noted by Orians and Heer-

[3] An obvious exception is when people form cooperative groups to compete more effectively with other groups, as occurs in sports, warfare, and political coalitions (e.g., Alexander, 1979, 1987).

wagen, "It may be difficult for many of us, with the year-round supplies of a wide array of fruits and vegetables in our supermarkets, to understand the importance of the first salad greens of the season to people throughout most of human history" (1992, p. 569). Appreciating the beauty of a blossom, the loveliness of a lilac, or the grace of a gazelle are all ways in which people can, in some small measure, fill their daily lives with evolutionarily inspired epiphanies of pleasure.

Having adequate resources to fulfill desires (Diener & Fujita, 1995), making progress toward fulfilling them (Cantor & Sanderson, 1999), achieving a state of "flow" in the process of achieving them (Csikszentmihalyi, 1990), and succeeding in fulfilling them in particular domains such as mating (Botwin et al., 1997) provide a few of the evolutionary keys to increasing human happiness.

## Conclusions

Evolutionary psychology yields insight into some of the major obstacles to achieving a high quality of life—discrepancies between modern and ancestral conditions, the existence of evolved mechanisms designed to produce psychological pain, and the inherently competitive nature of some evolved mechanisms. Given these circumstances and constraints, improving the quality of life will not be easily or simply achieved. Knowledge of evolutionary obstacles, however, provides a heuristic for discovering places to intercede. The human menu of evolved strategies is large and varied, and modern humans have the power to create conditions to activate some strategies while leaving others dormant.

This article perforce has neglected or only obliquely touched on many of the complexities of human happiness, such as the finding that individual differences in dispositional happiness appear moderately heritable (Tellegan et al., 1988), that perpetual states of happiness would almost certainly have been maladaptive (Barkow, 1997), and that repeated short-term pleasures sometimes produce enduring long-term pain (Solomon, 1980). Comprehensive theories of human happiness will have to explain adaptively patterned phenomena such as why winners of competitions experience a hedonic and hormonal boost (Mazur & Booth, in press) and why women's feelings of well-being appear to peak during the late follicular phase of the ovulatory cycle, when fertility and chance of conception are maximal (Sanders, Warner, Backstrom, & Bancroft, 1983). A more complete theory must also explain why some sources of happiness and subjective distress differ profoundly for men and women, for parents and children, and for the same individuals at different stages of life as they confront predictably different adaptive problems (Buss, 1999). Future work could profitably include an account of the evolutionary psychology of hedonic trade-offs inherent in some activities, such as an extramarital affair that produces the immediate reward of sexual gratification, but a more distant and uncertain future risk of marital disruption and reputational damage.

As a species, humans have conquered many of the external hostile forces of nature that formerly threatened bodily survival. They have created environments that are relatively friction free; they have reduced infant mortality, polio, and malaria; conquered food shortages through agriculture; reduced the destructive impact of extremes of temperature and climate; and eliminated most predators. With a deeper understanding of the evolved mechanisms of mind that define who humans are and how they were designed to function, people may eventually acquire the ability to control some of the more destructive social conditions. Through this knowledge, people can take a few halting steps toward fulfilling the human desire for happiness.

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