Handbook of Approach and Avoidance Motivation

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Evolution of Evaluative Processes II

16 Approach and Avoidance Motivation(s): An Evolutionary Perspective

Douglas T. Kenrick and Michelle N. Shiota

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Consider the following:

- The refreshments table at a party, loaded with meats, cheeses, potato chips, nuts, and desserts full of sugar and saturated fat;
- A physically attractive member of your preferred sex;
- An adorable kitten, mewing for attention; and
- Your parents.

Now consider this second list:

- A scorpion on the living room rug;
- A full glass of rotten, smelly milk;
- A driver who cuts you off on the freeway, making an obscene hand gesture; and
- Your romantic partner, laughing with his or her extremely attractive ex.

At first glance, all of the items on the first list are desirable, things or people we might want to approach, and those on the second list are undesirable, things or people we might want to avoid. At first, the utility of approach

and avoidance in each case might seem obvious. However, closer examination of the lists challenges first impressions. First, our instinctive response to some of these situations can be quite alarming. For example, one might justifiably want to chase after the offending driver at high speed, return the hand gesture, and possibly ram into the back of his or her car. How can we explain the common impulse to do something so dangerous and foolish? A more subtle example lies in the cholesterol-laden refreshment table. Most humans find these kinds of foods extremely desirable in terms of taste; unfortunately, these foods are also strongly linked with many of the current major causes of death and disease in the developed world.

On closer examination, the differences among items in each list also become more salient. For example, you might want to approach the refreshments table, the potential romantic partner, and your parents, but not (we hope) in exactly the same way. Similarly, the strategy appropriate to avoid a glass of rotten milk is quite different from one that will prevent your partner's renewed interest in a former mate. From this perspective, the concepts of "approach" and "avoidance" are far from unidimensional.

Yet a third issue emerges when we consider the context surrounding one's experience of each item, including combinations of the items on the two lists. For example, your reaction to an attractive man or woman might depend, at least partly, on whether you are currently "spoken for" or not. If you are currently involved with someone else, you could still approach, but you might risk damaging your current relationship. Consider also the kitten walking toward a scorpion on the living room rug, preparing to play with it. You run toward the scorpion, push the kitten away, and step on the threat. Approach and avoidance are even more intertwined now—you have just physically moved toward the threat and distanced yourself from the desirable object, risking harm to yourself in the service of avoiding harm to a loved one.

EVOLUTIONARY PERSPECTIVE ON APPROACH AND AVOIDANCE MOTIVATION

In this chapter, we contend that an evolutionary perspective on approach and avoidance motivation helps make sense of each of these complications. Our discussion will incorporate three key features of an evolutionary perspective on behavior: functionality, domain-specificity, and trade-offs. We will argue that approach and avoidance are most usefully conceptualized in terms of end states, rather than behaviors, and that many end-states people consistently approach and avoid are best understood in terms of their fitness implications in ancestral environments (Elliot, 2006). We will argue further that mechanisms of approach and avoidance are many and varied, differing in qualitative ways depending on the particular problem domain one currently confronts. Last, we will suggest that there are few cases of stimuli that are simply "approachable" or "avoidable." An evolutionary perspective helps us to predict the "trade-offs" individuals will make in various situations, according to individual ecological factors, individual differences, and the actor's developmental phase. Thus, an evolutionary perspective distinguishes between approach and avoidance at multiple levels of analysis (e.g., function, behavior), and offers more finely grained predictions about particular approach and avoidance behaviors in various situations. We will discuss the implications of this perspective for future research on approach and avoidance.

Functionality: What Are the Adaptive Purposes of Approach and Avoidance?

From an evolutionary perspective, the first question one asks about a general behavioral tendency is: How might this tendency have increased the chance that our ancestors would survive and reproduce, increasing their representation in the gene pool of the future? Most psychologists are functionalists at some level, but we often think about "function" in nonevolutionary terms. For example, psychologists often talk about motivations to feel good, avoid discomfort, raise self-esteem, or help make the world a better place. Such analyses emphasize function at the level of the pleasantness of immediate experience, or long-term sociological consequences. An evolutionary analysis also recognizes that feelings are functional, but goes one critical step further by asking what feels good when, and how might that have served to pass one's genes on to future generations more successfully? (Alcock, 1993).

From an evolutionary perspective, one begins with the presumption that any category of end-state that people reliably approach was likely associated with opportunities for enhancing inclusive fitness—the representation of your genes in future generations either through your own offspring, or those of your genetic relatives—in ancestral environments. These opportunities ultimately come down to a few simple categories: (1) obtaining food and water, and other survival essentials; (2) finding a mate or mates; and (3) nurturing offspring (and genetic relatives capable of reproducing), so they can reproduce in turn. Conversely,

any category of end-states that people reliably avoid was presumably associated with threats to inclusive fitness, such as (1) danger of death or serious bodily harm that would interfere with reproduction; (2) loss of survival essentials; (3) loss of mating opportunities, including the loss of an existing mate through death, abandonment, or poaching; and (4) death of offspring (or genetic relatives capable of reproducing). In order to explain any species-typical propensity to approach or avoid a category of targets, an evolutionary perspective links that propensity back to one or more of these proximal opportunities or threats.

One could think about approach and avoidance as behavioral tropisms, literally movements toward desirable stimuli and away from undesirable stimuli. Simple living organisms are equipped with unconditional tropic responses, such as a plant's tendency to grow toward light or to extend its roots toward water. In thinking about complex mobile organisms, however, it makes more sense to think of approach and avoidance in terms of strategies for attaining *goals*—sets of responses that increase the probability of a desired outcome, or decrease the probability of a negative outcome. Thinking in terms of goals makes it easier to see why one might functionally avoid some threat by moving toward its source (as in the case of the kitten and the scorpion), or why one might approach some opportunity by maintaining distance or temporarily moving in the opposite direction.

According to an evolutionary perspective, functionality is defined in terms of adaptive outcomes (on average) in ancestral environments, which may or may not translate into functionality in any given current environment (Crawford, 1998). Consider the common automatic response to the rude driver mentioned at the beginning of the chapter—anger, sometimes to the point of pursuing the driver and making threatening gestures of one's own. This is unlikely to produce any adaptive benefit, and on rare occasions, the outcome is highly maladaptive—an arrest for reckless driving, damage to your car, even death. Throughout most of our evolutionary history, however, angry displays at other people who wantonly insulted us or treated us unfairly would have served, on average, to ensure that one's status within the group was not compromised, and status comes with serious fitness benefits in terms of food, territory, and mates. Our ancestors did not have frequent anonymous interactions with strangers, and the potential for a high speed auto accident or police intervention was not part of the picture then, so it does not get factored into our instinctive reactions.

The impulse to chase someone down and let them know how angry you are is still there, however. Even in ancestral environments, such a response would have been adaptive if it resulted in average positive outcomes, even if it occasionally resulted in losses (demonstrating anger always carried a cost of reciprocal aggression, even before SUVs). However, such demonstrations are common (in humans and in other animals) because they presumably resulted in net benefits sufficient to balance the risks. Thus, an evolutionary perspective helps us to explain and predict a number of behavioral tendencies that seem absurd or even harmful in the present environment.

Two key questions to ask, if one adopts an evolutionary perspective on approach–avoidance motivation, are (1) which categories of situations would our ancestors have needed to approach (i.e., recurrent opportunities) and (2) which would they have needed to avoid (i.e., recurrent threats), to reproduce more successfully on average?

Domain-Specificity: Why Approach and Avoidance Strategies Vary

From an evolutionary perspective, general motivations to "feel good" or "avoid feeling bad" are inadequate to solving the very different problems humans face in different domains. Different goals require different actions, as in the examples of approaching the food, the potential romantic partner, and one's parents discussed earlier. Goals predict behavior better than available targets—the same target person may be approachable for some goals, but not for others. For example, it "feels better" to share material resources with one's sibling as opposed to a stranger, but the reverse is true for sharing sexual favors (Ackerman, Kenrick, & Schaller, 2007; Lieberman, Tooby, & Cosmides, 2007). Evolutionary psychologists use the terms "domain-specificity" or "modularity" to indicate the presumption that evolved behavioral mechanisms are functionally and neurologically discrete (Tooby & Cosmides, 2005).

Before researchers began to think about human behavior in evolutionary terms, it was presumed that there are an infinite and unconstrained number of possible approach or avoidance responses, contingent only on the idiosyncrasies of one's particular learning history. One could learn to associate any stimulus with sensory pleasure or pain, and thus any stimulus could acquire the properties of a goal. For example, Rachman and Hodgson (1968) conducted a study that involved conditioning sexual arousal to a pair of knee-length boots, on the general assumption that sexual arousal could be conditioned to whatever random stimuli happened to be present during genital stimulation. On this view, the potential associations between specific characteristics of the environment

and a sense of reward or punishment are unlimited. Not only can individual features of the environment become linked to reward or punishment, but interactions between multiple features can as well. Implications of this can be daunting to contemplate, as Cronbach (1975) observed:

> "Every second-order interaction is moderated by third order interactions, which in turn are moderated by higher order interactions. Once we attend to interactions, we enter a hall of mirrors that extends to infinity" (Cronbach, 1975, p. 119).

On entering any social situation, for example, one is presented with an overwhelming number of potentially important cues—there are several people, wearing different colored clothing and speaking with different accents, differing in height, standing or sitting, interacting with different people, and so on. If one has an unpleasant experience that "feels bad" in this situation, what can one learn from it? To avoid food in other people's houses? To avoid people? To avoid people in red shirts? To avoid tall people? To avoid people with a certain accent, or those sitting down? Some of these cues may actually be relevant to the cause of the unpleasant experience. For example, if the people in red shirts are members of a competing sports team, it might in fact be a good marker of potential hostility. At the same time, the relevance of a given cue may depend on more or less transitory factors (the social event is a party at the home of an opposing team member, and the opposing team wears red), and many cues will be useless in predicting future outcomes regardless of context. Trying to decode which of this myriad of cues is the one actually associated with some desired or aversive outcome would be completely overwhelming with no limitations or guidance.

Thinking in evolutionary terms can help researchers discover a pathway out of this hall of mirrors (Kenrick, et al., 2002). Evolutionary reasoning—bolstered by neurophysiological evidence (Panksepp, 1982)—suggests a finite set of fundamental human goals, each linked to an adaptive problem posed by the environments in which ancestral humans lived. On the basis of several reviews of literature related to this question (Bugental, 2000; Buss, 1999; Fiske, 1992; Kenrick, Li, & Butner, 2003), we have suggested several key goals confronting humans living in social groups. For social mammals, these include alliance formation (getting along with other group members), self-protection (avoiding predation and conflict with other organisms who want the same resources), enhancing status (gaining preferential access to resources and mates), finding mates (choosing desirable mating partners), maintaining long-term mating bonds (hanging on to desirable partners), and offspring/kin care (contributing to the successful development of one's own offspring and other close genetic relatives).

Each of these goals involves different core opportunities (things to approach) and threats (things to avoid) (Schaller, Park, & Kenrick, 2007). We summarize these in Table 16.1; and also include distinct opportunities and threats in nonsocial contexts (e.g., finding edible food and

TABLE 16.1

Fundamental Goals and Associated Opportunities and Threats

Goal	Opportunities to Approach	Threats to Avoid
Essential resource acquisition	Food	Loss
	Water	Stealing or cheating by conspecifics
Self-protection	Shelter	Predators
	Parents and other adult caregivers (usually kin)	Violent conspecifics
	Trusted nonkin (especially in groups)	Toxins
Co-operative alliance formation	Sharing with alliance members	Rejection
	Play (co-ordination, bonding with alliance members)	Violation of group etiquette
Status enhancement	Socially valued accomplishments	Failure on socially valued tasks
	Conspicuous resource display	Insults by group members
	Connections with high-status group members	Connections with low-status group members
Finding mate	High-fitness potential mates	Same-sex competitors
Maintain mate	Fulfilling mate's needs	Illness or death of mate
		Sexual infidelity/mate-poaching
Offspring/kin care	Fulfilling offspring/kin needs	Illness or death of offspring/kin

avoiding toxins). Satisfying any one of these goals may facilitate others, or be facilitated by them. For example, forming social alliances may help one to acquire survival essentials such as food, and to protect oneself from threats from predators and out-group conspecifics. However, all of the goals ultimately come back to those listed earlier as fundamental, and the particular problems posed by the specific tasks of finding a mate, finding food, avoiding an enemy, and so on require different skills than those involved in finding a friend.

We briefly consider each of these goals below, with particular attention to what people generally approach, and hope to avoid, in each larger goal.

(1) *Essential resource acquisition*. Before even worrying about whether one is getting enough respect or affection, one needs to satisfy a number of basic bodily needs. Opportunities to acquire food and water are essential to attaining this goal, as is avoiding threats to these resources through loss, stealing, or other catastrophes.

(2) *Self-protection*. Human beings are vulnerable to a wide range of threats to physical well-being. We can be attacked by predators, or by violent conspecifics who want our possessions or our territory. We can ingest potentially lethal toxins, including spoiled food. These threats must be avoided. Fortunately, we can also approach stimuli that provide opportunities for protection. At the simplest level, this includes safe shelter. However, protection is often offered by conspecifics, both close kin (especially relevant for young and vulnerable individuals, who rely on parents and other adult kin for protection), and trusted nonkin within one's group. In the next section, we discuss the particular motivational system involved in forming and maintaining in-group alliances. There may, however, be distinct mechanisms involved in approaching groups of friends when one is concerned about threats (Taylor et al., 2000). Under these circumstances, for example, one might be inclined to prefer relatively larger aggregations of friends than might be desirable for a shared meal or a conversation in which intimate information is exchanged.

(3) *Co-operative alliance formation*. Essential resource acquisition and self-protection can be accomplished by individuals, but humans accomplish these tasks far more effectively in coalitions marked by co-operation and mutual exchange of resources (Cosmides & Tooby, 1992; Eibl-Eibesfeldt, 1975; Hrdy, 1999; de Waal, 1996). On the approach side, this coalitional goal may be linked to motivations toward sharing and play with alliance members. On the avoidance side, one must avoid threats of rejection by the alliance, and behaviors that might lead to rejection (such as violation of group etiquette).

(4) *Status enhancement*. For both sexes, there are tremendous fitness advantages to gaining and maintaining social status, including greater access to material resources and mating opportunities, and extended social alliances (de Waal, 1996; Fiske, 1991; Keltner, Gruenfeld, & Anderson, 2003). Because females use male status as a cue for mate selection, males are especially likely to be concerned with enhancement and potential loss of status (Buss, 1999; Kenrick & Luce, 2000). On the approach side, status enhancement can be achieved through socially valued accomplishments, through the conspicuous display of possessions, and through connections with those higher in the group hierarchy. This goal is also associated with a set of situations to avoid, including failing at socially valued tasks, being insulted or snubbed by other group members, and obvious relationships with those lower in the group hierarchy.

(5) *Finding mates*. Access to high-quality mates is essential to reproductive success, so people are likely to selectively attend to features connoting reproductive viability, and to pursue those people. Because of inherent differences in amount and type of parental investment, males and females are likely to approach and avoid somewhat distinct sets of features in potential mates. For instance, women place more value on indications of status than do men (Kenrick, Sundie, Nicastle, & Stone, 2002; Li & Kenrick, 2006; Sadalla, Kenrick, & Vershure, 1987). Compared with women, men place more value on age and other indicators of fertility (Kenrick & Keefe, 1992). In addition, because females make a much greater investment than males in child-bearing, females are more likely than males to prefer partners interested in long-term commitment; the reverse is true for short-term encounters (Clark & Hatfield, 1989; Haselton & Buss, 2000; Kenrick, Sadalla, Groth, & Trost, 1990).

Because biparental care requires a number of shared inputs from both parents, however, there are a number of features that both sexes seek in partners, such as co-operativeness (Li & Kenrick, 2006). Features associated with health and "good genes" are also considered attractive by both men and women (Gangestad & Simpson, 2000). On the avoidance side, both men and women must deter threats posed by same-sex competitors for mates, although men's and women's most dangerous rivals have somewhat different characteristics. Men are more concerned about competition from other men who are high in status, and women are more concerned about other women who display signs of fertility and physical attractiveness (Buunk, Massar, & Dijkstra, 2007; Gutierres, Kenrick, & Partch, 1999).

(6) *Maintain mate*. Because human infants are helpless and slow to develop, their survival is enhanced by the presence and support of multiple adults, and both biological parents have the greatest investment in the child's survival. Thus, long-term co-operative mating relationships would have been highly adaptive for our ancestors (Geary, 1998). Keeping a partner involves a distinct set of problems from finding a mate, however. Once a committed relationship is forged, demonstrations of one's attractiveness likely become somewhat less important than demonstrations of one's co-operativeness, generosity, and emotional stability. For this reason, it behooves one to approach opportunities to provide material support, emotional nurturance, and generally make sure one's mate's needs are fulfilled. One certainly needs to avoid any threats to the mate's life and physical health, as well as signs of potential infidelity or mate poaching.

(7) *Offspring/kin care*. The ultimate reason that human parents maintain long-term bonds is for offspring care. In 95% of other mammalian species, parental care is provided exclusively by the female without assistance from the male (Geary, 1998). Unlike other mammals, whose offspring are precocial and tend to be well-developed and somewhat mobile at birth, human offspring are altricial, or helpless at birth. In this way humans are more like a typical bird species than a typical mammalian species. Also like birds, humans have evolved a mating system that involves biparental care for their helpless offspring.

The problems involved in caring for offspring are different from those involved in getting along with nonkin alliance members or mates. The usual rules of social exchange, for example, do not apply in relationships between children and their parents (Kenrick, Sundie, & Kurzban, in press). Instead, parents provide benefits for children with little or no expectation of reciprocation, all the while welcoming new opportunities to fulfill the offspings' needs and protect them from harm. This is not to say that parental provisioning is noncontingent; factors such as the parent's remaining reproductive potential, the number of other offspring, and the particular child's health are all critical determinants of differential parental care (Daly & Wilson, 1998; Geary, 1998; Hrdy, 1999; Kenrick, Sundie, & Kurzban, in press). There are design features built into parents to ensure parental care, including the familiar mechanisms of bonding (Bowlby, 1979; Zeifman & Hazan, 1997). There are also design features built into the children, who come preequipped with attachment mechanisms designed to direct and exploit parental investment—by crying when they are alone, hungry, or in pain, and cooing and smiling when parental attention is adequately monopolized (Bowlby, 1979; Eibl-Eibesfeldt, 1975). Besides investing directly in one's offspring, humans live in familial groups, and often care for their siblings, nephews and nieces, and their grandchildren. Again, those investments are not noncontingent, but finely tuned to factors such as the existence of other more closely related children (Laham, Gonsalkorale, & von Hippel, 2005).

Meaning of Domain-Specificity

We have argued that human approach and avoidance motivations and their associated behaviors are largely domain-specific, rather than global. It is important to distinguish between "domain-specificity" in the sense of specific goal content from "domain-specificity" in the sense of input format—an evolutionary perspective implies the former, but not necessarily the latter (Barrett & Kurzban, 2006). Domain-specific mechanisms are attuned to particular arrangements of input cues, but can occasionally be triggered by stimulus arrays mimicking those cues. For example, other young mammals (puppies and kittens, for example) have many of the same features that trigger parental sympathy, such as large heads and eyes, as well as high pitched whimpering cries (Eibl-Eibesfeldt, 1975). This is important in explaining both the situations in which some adaptation is clearly functional, and those in which a false alarm is likely. This distinction is also important in explaining why some modules can be content-general while still performing a fairly specific type of information processing, such as the module for

working memory that briefly stores numbers, words, events, and information in a number of other formats.

It is also important to note that although domain-specificity does imply some degree of modularity in brain processes, most modern evolutionary theorists do not rigidly accept all the criteria for a module that Fodor suggested 25 years ago (Barrett & Kurzban, 2006; Carruthers, 2005). Fodor's (1983) criteria for modularity included domain-specificity, encapsulation, automaticity, inaccessibility to consciousness, speed, shallow inputs, neural localization, and specific breakdown patterns. As Barrett and Kurzban (2006) note in a recent review of the concept of modularity, the evidence accumulated in the intervening years suggests that not every domain-specific process meets each of the above criteria.

For example, early views of mental modules presumed that each functional unit would be represented in a "spatial chunk" of brain tissue (Barrett & Kurzban, 2006, p. 641). Evidence suggests instead that functional units may in some cases be neural networks distributed across different parts of the brain. This leads to an asymmetry in the implications of fMRI findings: differing regions of activation for two processes suggests different modules, but activation of the same region for two processes does not necessarily imply a single module. Two possible solutions for this dilemma include (1) eventually increasing the spatial resolution of scanning, or, more likely; (2) applying new factor analytic techniques for examining networks of activation across the brain, rather than individual voxels or larger subregions of neural tissue (Alexander & Moeller, 1994; Moeller, Strother, Sidtis, & Rottenberg, 1987).

Similarly, evidence suggests some degree of encapsulation in mental mechanisms—the existence of separate processes for handling different types of stimuli—but that encapsulation is incomplete. In the current understanding of psychological modularity, inputs from any given system can be sensitive to output from other systems. For example, simple memory processes for human faces are influenced by the perceiver's emotional state, and the emotional state on the target's face, although the modules for face recognition, emotion detection, and emotional experience are distinct (Ackerman et al., 2006; Becker, Kenrick, Neuberg, Blackwell, & Smith, 2007).

Summary

Very different rules apply to approaching different types of desirable opportunities relevant to different kinds of goals (food versus mates versus parents, for example). Likewise, different sets of rules apply to avoiding specific threats relevant to different kinds of goals (poisonous foods as opposed to mating rivals). Although much about modularity is yet to be understood, there is overwhelming evidence that a simple distinction between approach and avoidance systems is inadequate.

Functional Trade-Offs in Approach and Avoidance Motivation

Recall the dilemma posed at the beginning of the chapter, of the individual deciding whether to approach an attractive potential partner, knowing that to do so threatens his or her relationship with an existing mate. Replace the kitten in the scorpion scenario with your own child and you have another dilemma—keep a safe distance from the threat, or approach the threat in the interests of protecting your offspring? Even the refreshment table poses a quandary. If you approach and heartily enjoy the food too often, you risk becoming less attractive to current or potential mates. All of these scenarios illustrate a third principle of evolutionary perspectives on approach and avoidance: few situations involve only a single goal, so trade-offs between opportunities and threats are inevitable.

Because approach–avoid decisions typically involve such trade-offs, which strategy is most functional at any time depends on a number of situational details. Thus, evolved psychological mechanisms in approach and avoidance are more likely to provide "if-then" algorithms or decision rules, taking the broader environment into consideration, than stereotyped behaviors (Kenrick, Li, & Butner, 2003; Kenrick, 2006a). At a broad level of analysis, different ecological factors may lead to very different approach and avoidance strategies within a species. For example, humans may mate polyandrously (one female with multiple males) when resources are very scarce, as brothers will fare better if they share investment in a small number of offspring (Crook & Crook, 1988). Extreme polygyny (one male with multiple females) is found under conditions where resources are rich but variable, and there are steep social hierarchies, such that some families can accumulate much more than others. In such circumstances a female's offspring may fare better if she mates polygynously with a member of a wealthy family than they would do if she mated monogamously with a poorer man. The circumstances predicting these variations in humans also predict variations in mating arrangements in bird species.

One appealing aspect of evolutionary psychology is its links with other disciplines, particularly biology and anthropology. Evolutionary theorists taking a broad perspective on different species and different human societies have developed some useful theoretical tools for thinking about human behavior that would not necessarily arise from considering only the people living in a

particular culture at a particular time. Life history theory is one broad set of concepts for considering how a particular species solves its particular problems of surviving and reproducing, and is particularly germane to the issue of trade-offs (Partridge & Harvey, 1988; Kenrick & Luce, 2000; Kaplan & Gangestad, 2005; Stearns, 1976). Life-history theorists begin with the presumption that organisms are involved in a struggle to acquire and efficiently allocate limited energy resources. All mammals, for example, must allocate resources to (a) somatic development, (b) mating effort, and (c) parenting effort. Allocation of resources to one category necessarily involves trade-offs—searching for an additional mate means less time for parenting, feeding one's own body means less resources for one's offspring, and so on (Kaplan & Gangestad, 2005).

One implication of life-history theory for our purposes is that the outcome of trade-off situations can be predicted by knowing the actor's species and stage of life. Different species make very different allocations to the different life phases. For example, oak trees spend many years developing before they begin reproducing, but then they produce thousands of seeds, and continue reproducing for decades. Salmon spend 2 or 3 years developing, then reproduce in a single burst of reproductive effort, producing hundreds or thousands of eggs and then dying. Neither of these species devotes much effort to parenting. Elephants, on the other hand, are like oak trees in that they devote many years to somatic development and continue to reproduce for decades, but unlike oaks in that they have a very small number of offspring, and invest tremendous amounts of parental resources in each one.

There are also variations within species in life-history strategies. In most vertebrates, for example, females and males have different life histories. Human females, for example, mature earlier than males, invest several years in choosing a mate, and necessarily invest very high amounts of resources in each offspring. Human males can in theory, and sometimes in practice, have many more offspring, and need not invest as much in each offspring.

Punchline for Approach–Avoidance Motivation

Given that there are trade-offs everywhere in nature, nothing is purely and simply approachable, or purely and simply avoidable. Approaching a desirable potential mate is likely to bring costs and risks, such as life-threatening competition with other suitors, or loss of a current relationship. Similarly, the obvious self-protection strategy of running away from a dangerous predator (avoidance) may also have associated opportunity costs, such as leaving one's relatives at risk, or sacrificing valuable resources.

RESEARCH ADOPTING AN EVOLUTIONARY PERSPECTIVE ON APPROACH AND AVOIDANCE

Our discussion thus far has suggested that the processes involved in approach and avoidance should vary in functional ways depending on what fundamental motivational domain is currently active, and depending on individual differences in key life-history factors that affect decision trade-offs. In this section, we will briefly review some research following from this perspective, considering some classic research as well as several recent research findings from our own labs.

Same Target May Elicit Approach or Avoidance, Depending on the Goal

Social psychological models of close relationships traditionally involved a search for domain-general processes underlying all categories of intimacy. For example, reinforcement-affect theory (Clore & Byrne, 1974) posited that our feelings about a given target person were a function of the ratio of rewards to punishments that we had experienced in that person's company. The result of a history of rewards associated with a target person would incline us to be attracted toward that person, and the model presumed that we were inclined to approach those to whom we were attracted. Traditional exchange-based models presumed a slightly different domain-general process underlying attraction toward another person, emphasizing the expected ratio of benefits to costs in interactions with that person as compared to available alternatives (Thibaut & Kelley, 1959; Walster, Walster, & Berscheid, 1978). In their traditional formulations, such models did not explicitly differentiate between different categories of intimate relationships, such as friends versus kin versus romantic partners, although they would have presumed that a greater frequency of interactions had the potential to yield a greater number of benefits.

Considered in evolutionary context, the qualitative differences between approach responses in relationships with friends, mates, and close kin are more apparent. It is true that brothers and sisters have generally experienced a large number of rewarding interactions with one another, and people are especially likely to desire to affiliate with close kin throughout their lives (Daly, Salmon, & Wilson, 1997). Exchange relationships with kin tend to be biased

in favorable ways (Ackerman et al., 2007). At the same time, the "positive affect" felt toward first-degree kin does not generally extend to the sexual domain. Instead, people asked to imagine romantic or sexual contact with their brothers or sisters report strongly negative affective reactions (Ackerman et al.; Lieberman et al., 2007).

From an evolutionary perspective, it is generally presumed that this uniquely negative response to approaching kin for mating goals is linked to the potential dangers of combining harmful recessive genes. Although deleterious recessive genes are normally rare, the probability they will be shared by a brother and sister are high enough to make the costs of intra-familial mating outweigh the benefits (Lieberman et al., 2007; Van den Berghe, 1983). Another possible mechanism for preferring distant relatives as mates involves resistance to disease, which is decreased by mating with close relatives. Other species, not subject to human cultural norms, also disfavor sexual contact with close relatives, and will avoid mating with siblings (Lieberman et al.), even when they were not raised together.

Aversion to incestuous mating does not seem to depend on cultural taboos against incest, but is instead linked to biological mechanisms operating outside human consciousness. Humans appear to rely on childhood coresidence as a cue of relatedness, triggering a mechanism evolved to prevent incest (Lieberman et al., 2007), even when cultural norms encourage those children to mate. In a massive social experiment, children on Israeli kibbutzim were raised in small groups of boys and girls born around the same time. There were no social norms discouraging romantic or sexual involvements between "pod-mates", and such involvements were even encouraged. However, Shepher (1971) examined several thousand marriages among these individuals and found that, although the pod-mates became life-long friends, they rarely married one another. This finding is particularly interesting because of the wealth of data suggesting that people prefer to marry their neighbors (Bossard, 1932), and Israeli children were likely to marry others raised on the same commune, but not in the same pod. Similarly, the common practice in China of raising very young girls in the same household as their future husbands has been associated with low fertility and high marital dissatisfaction and dissolution, with greater problems found when the children had been raised together from an early age (Wolf, 1993).

Activating Different Fundamental Motives Triggers Approach or Avoidance of the Same Target

In a number of studies conducted with our colleagues, we have been activating different motivational states associated with the goals described in Table 16.1; and observing the consequences for cognitive and affective responses to various social situations (Griskevicius, Cialdini, & Kenrick, 2006a; Maner et al., 2005). The results of these experiments suggest that approach and avoidance inclinations toward a particular social stimulus can change dramatically, depending on the judge's current motivational state. For instance, a person with an otherwise neutral facial expression may be perceived as feeling anger by judges who are themselves feeling fear, if the target is a male member of a discriminable outgroup (Maner et al., 2005; Schaller, Park, & Mueller, 2003). Other research suggests that people are quicker and more accurate in detecting facial expressions of anger on males than on females, and that this process reflects physiognomic features of the male face rather than culturally recognized signs of gender (Becker et al., 2007). This "functional projection" makes sense given that threats to physical safety are more likely to come from strange males than strange females.

In another series of studies examining motivation-driven variations in approach and avoidance behaviors, participants were exposed to manipulations inducing either self-protective or mating motivation (e.g., by reading scenarios involving being alone in a dark house at night and overhearing sounds of someone breaking in, as opposed to imagining a romantic encounter with an attractive and desirable person). After these inductions, participants encountered another judgment task in which they got information regarding the opinions of other group members. Results indicated that both men and women were more likely to conform to group opinion after self-protective goals had been primed than in a neutral prime condition. Activating mating motives, however, generally had opposite effects on male and female participants. Whereas females in a romantic frame of mind again conformed more (compared to a neutral control group), men did the opposite—actually going against group opinion (Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006b).

These results fit precisely with two separate sets of evolution-based predictions about the adaptive functions of conformity and counter-conformity for achieving different goals. Under conditions of threat from potentially dangerous strangers, both men and women profit from group cohesion. On the other hand, there is a sex difference in the mating consequences of displaying independence from group opinion. Throughout the animal kingdom, males are generally more likely to compete with one another in an attempt to draw attention to their unique characteristics than are females. This difference is linked to differences in sexual selection and

parental investment (Griskevicius et al., 2006a). The principle is well demonstrated by exceptions to the normal gender differences in life-history—when males contribute more to offspring than females do, as in phalaropes (a sandpiper-like bird), then females are more showy and competitive, and males are more selective.

Same Target May Elicit Simultaneous Approach and Avoidance Responses

In another series of studies, Ackerman and his colleagues (2006) found that the normal tendency for people to homogenize members of out-groups was erased if the out-group members were males with angry facial expressions. This fits with the rationale we discussed above that angry males from outgroups are likely to pose a physical threat. Given this effect, we had expected to find that people pay particular attention to such individuals. However, findings from eye-tracking studies have tended to show the reverse—with participants looking at out-group males, and at angry faces, for less time than they look at other targets (Kenrick, Delton, Robertson, Becker, & Neuberg, 2007). Yet the same studies find higher-than-expected memory for those same targets. This disjunction between visual attention and later memory makes some functional sense—staring at an angry stranger is probably not something one wants to do, given that stares are themselves seen as threat gestures. At the same time, one does not want to forget potentially dangerous individuals, and so they seem to show the effects of emotional memory enhancement (Cahill, Prins, Weber, & McGaugh, 1994). A fascinating implication of this research is that not looking does not mean not attending.

Other research from our labs has indicated an opposite disjunction between visual attention and subsequent cognitive processing. Although both sexes look at, encode, and later remember beautiful women, women look at handsome men, but do not remember them for more than a few seconds (Becker, Kenrick, Guerin, & Maner, 2005; Maner et al., 2003). The suppression effect for handsome male strangers seems less intuitively sensible at first, but does fit well with findings on women's criteria for mate choice. Several evolutionary psychologists have provided evidence to suggest that male physical attractiveness is associated with so-called good genes (Gangestad, Thornhill, & Garver, 2002). Hence, it makes sense handsome men's faces elicit initial attention from women. Consistently, we found more visual fixations for handsome men amongst women who are ovulating, who are unrestricted, or who are in a romantic frame of mind. However, even if a woman is interested in a short-term relationship, it is unlikely that that relationship will be with a man who has not stayed around long enough to pass several levels of initial screening. Before committing to a relationship with a man, women generally require additional information, including reliable information about the man's social status or financial status (Buunk, Dijkstra, Fetchenhauer, & Kenrick, 2002; Kenrick, Sundie, Nicastle, & Stone, 2001; Li, Bailey, Kenrick, & Linsenmeier, 2002). Clark and Hatfield (1989) found in two studies conducted across two decades that not a single woman accepted an offer of a sexual liaison with a strange man, even though about half were willing to go on a date with him.

Emotions Facilitate Approaching or Avoiding Particular Stimuli, and Not Others

According to an evolutionary approach to emotion, emotions prioritize particular fundamental goals and activate motivations to approach specific opportunities and avoid specific threats (Frijda, 1986; Lazarus, 1991; Plutchik, 1980). For example, compassion highlights offspring/kin care goals and associated nurturant motives, whereas pride highlights status enhancement goals and motives to advertise achievements and resources (Keltner, Haidt, & Shiota, 2006). Neuroscience research does support the existence of a system broadly facilitating reward anticipation and acquisition (Ghitza, Fabbricatore, Prokopenko, Pawlak, & West, 2003; Knutson, Taylor, Kaufman, Peterson, & Glover, 2005). However, this system is likely to interact with other systems in mediating particular positive emotions and associated motivations (Young & Wang, 2004). Thus, an evolutionary perspective on approach and avoidance motivation strongly suggests the existence of neurologically discrete positive and negative emotions (Tooby & Cosmides, 2005).

In one series of studies, we have considered how this approach might be relevant to consumer choices of various products. According to the affect infusion model (Forgas, 1995), people should learn to associate stimuli in the environment with their current mood state, such that an object or message encountered while one is in a positive mood will be "infused" with positive connotations but infused with negative connotations if encountered while one is in a negative mood. Previous studies of emotion and product attractiveness have supported this model, concluding that positive emotion generally enhances one's perception of product attractiveness (Batra & Stayman, 1990; Edell & Burke, 1987). An evolutionary approach, however, would suggest that specific positive emotions, facilitating approach of opportunities relevant to different goals, would only affect perceived attractiveness of goal-relevant categories of products.

Results reveal that, relative to a neutral condition, experimentally elicited pride increases the attractiveness of conspicuous, "public" items but not of inconspicuous household items of roughly the same value; contentment increases attractiveness of inconspicuous items but not conspicuous ones; and compassion has no effect on product attractiveness at all (Griskevicius, Shiota, & Nowlis, 2007). These findings suggest that positive emotions do not generally facilitate approach, but rather that they facilitate approaching objects that satisfy the specific goals activated by the emotion.

Much about the extent of modularity in human emotion is still unknown. For example, it is unclear whether there are separate modular systems designed to deal with fears of predators, fears of violent conspecifics, and fears of social disapproval, or whether these are all mediated by the same circuitry (Öhman & Mineka, 2001). Similarly, it is unclear whether the disgust systems involved in responding to noxious food substances share some or all their underlying machinery with systems mediating moral disgust (Haidt, 2001). Still, an evolutionary approach provides guidance in developing hypotheses and research paradigms for these and similar questions.

IMPLICATIONS OF AN EVOLUTIONARY PERSPECTIVE: FUTURE DIRECTIONS FOR RESEARCH

Adopting an evolutionary perspective on approach and avoidance raises a number of specific research questions. At the simplest level, it raises questions about the degree of modularity in the human mind. It seems functionally implausible that the same general mechanism is used for all forms of approach or for all forms of avoidance, and indeed there is evidence for this assumption (Garcia & Koelling, 1966; Sherry & Schacter, 1987; Wilcoxon, Dragoin, & Kral, 1972). Yet many questions remain about exactly how the mind works with regard to these processes. How many distinct approach and avoidance systems there are at the neurological level? How much sharing is there of subprograms between different modules? To what extent are these systems localized versus physically diffuse?

Specific Research Questions Suggested by the Evolutionary Perspective

A particular, largely unexplored research area suggested by an evolutionary perspective on approach motivation is distinguishing among multiple, potentially discrete positive emotions (Shiota, Campos, Keltner, & Hertenstein, 2004; Shiota, Keltner, & John, 2006). An evolutionary approach suggests the existence of discrete positive emotions that help us take advantage of specific kinds of opportunities in the environment, as well as discrete negative emotions that help us respond adaptively to different kinds of threats. Preliminary findings suggest that different positive emotions are associated with distinct facial and upper-body displays (Shiota, Campos, & Keltner, 2003; Tracy & Robins, 2004), and distinct effects on information processing (Griskevicius & Shiota, 2007), and that different positive emotion dispositions are differentially associated with several core personality processes (Shiota et al., 2006). Still, much research applying a discrete emotion perspective to positive emotion is yet to be done.

We also reviewed the broad literature on life history strategies, which suggests that every decision made by every organism involves trade-offs between different potential allocations of effort, particularly between bodily development and health versus mating opportunities versus offspring care. That perspective suggested that there are reliable links between individual development and life-history allocations, and that those links are reliably mediated by ecological factors. Despite the power of this perspective in explaining the behavior of animals, very little research on humans has been elucidated by this perspective, and most of that research has been conducted by anthropologists. Psychological research techniques could be immensely helpful in understanding how people approach and avoid different survival, mating, and kin care opportunities at different phases of their lives, and how such processes are affected by ecological factors and individual differences (Gangestad & Simpson, 2000).

General Implications of an Evolutionary Approach for the Process of Research

An evolutionary approach to behavior has a number of distinct advantages. One of these is theoretical cohesiveness, in that adopting an explicitly evolutionary perspective helps us understand how proximate cognitive, affective, and behavioral processes make sense in light of general principles that apply across human cultures and across species. One common misconception is that the search for universal principles underlying diverse behavioral phenomena implies the absence of culture- or species-specific factors influencing behavior. Evolutionary theorists, whether they are studying humans or any other animal, are actually quite interested in the specifics characterizing that species, as well as in homologous processes. Evolutionary theorists studying human behavior are also interested in cultural variability as well as

cultural constants (Ekman & Friesen, 1971; Gangestad, Haselton, & Buss, 2006; Kenrick, Nieuweboer, & Buunk, 2007; Norenzayan, Schaller, & Heine, 2006). At the same time, an evolutionary perspective counsels that the particulars of behavior within a given species or within a particular culture are not likely to be the products of general processes incompatible with the laws of natural selection (Kenrick, 2006b; Tooby & Cosmides, 2005).

There are numerous examples of cultural variation in what is desirable or undesirable that are still consistent with explanations rooted in evolutionary mechanisms. Mating preferences offer an excellent example of this phenomenon. As we noted earlier, some societies, such as the modern United States, regard polygamy as undesirable, if not evil; other societies have regarded it as normative, if not a positive good. We also noted that variations in the acceptance and prevalence of polygyny as well as polyandry seem to vary across human societies according to some of the same conditions influencing their prevalence in other animal species (Crook & Crook, 1988).

Consider another example, cultural variability in age preferences for mates. Because human females universally undergo menopause, and males continue to be able to have children into their later years, an evolutionary life-history model predicts a universal tendency for men, as they age, to prefer women relatively younger than themselves. This preference for relative youth is not presumed to follow from sex differences in social power or status, but from an attraction toward fertility cues. Teenage boys, for example, who have very little social status and power, report being attracted primarily to women several years older than themselves, though they do not believe those women are likely to reciprocate their interest (Kenrick, Gabrielidis, Keefe, & Cornelius, 1996). For very young men, it is older rather than younger women who are likely to manifest stronger fertility cues. However, men in their forties and fifties are attracted to women much younger than themselves, and this tendency appears to be universal (Kenrick & Keefe, 1992; Campos, Otta, & de Oliveira Siqueira, 2002).

The Tiwi society might appear to be an exception to this pattern, in that men in their twenties all marry older widows (Hart & Pillig, 1960). On closer examination, however, Tiwi men are attracted to younger women, but powerful older men have managed to monopolize all the young brides for themselves. This polygynous society requires all females to be married, whether they are young children or widows. Older men bequeath their own daughters at birth to another older male to whom they owe a favor, including having previously received one of his daughters as a bride. Because the older men are not interested in widows, young men are free to marry them; by so doing they may elevate their position in society, and also curry future favors from the widow's male relatives. Thus, Tiwi society represents a novel and unusual dynamic arrangement of norms that nevertheless reflects human nature. Men everywhere are attracted to relatively young, fertile females, men everywhere compete for power, and in many cases, men's power is converted directly into a monopoly on desirable mates (Kenrick, Nieuweboer, & Buunk, 2007). Exactly how this plays out in a given society depends a great deal on the larger economic and social structure, but the principles are the same.

Another misconception about evolutionary approaches, less prevalent but still persisting in some corners, is that evolutionary researchers search for particular cases in which an animal demonstrates a "human-like" behavior pattern, and then quickly jump to the conclusion that the two patterns are manifestations of homologous processes. Instead, good comparative research is attentive to the particular functional connections between adaptations and eliciting ecological factors, and generates hypotheses accordingly. For example, cats are among those species that are not responsive to the taste of sugar, whereas humans are among those species that are. Sweetness is a feature evolved to attract fruit-eating animals to plants at the time when the fruit is fully ripe, and when the plant can most benefit from seed dispersal. Thus, it would only be noticed by plant-eaters, and we might hypothesize than herbivores and omnivores, but not carnivores, would find the taste of sugar pleasant. Similarly, if the function of embarrassment/shame is to prevent aggression by group members after you have violated a social norm (Keltner & Buswell, 1997), then we should expect to see shame-like behavior in highly social mammals that live in "packs," such as humans and dogs, but not in more solitary mammals such as cats.

CONCLUSION

An evolutionary perspective suggests that there are multiple approach and avoidance systems at the functional and neurological levels, designed to deal with the unique problems regularly encountered by ancestral humans. Particular approach or avoidance mechanisms are likely to be triggered by functionally relevant factors in the immediate environment, and by chronic ecological factors in interaction with individual differences linked to gender, age, and other physical factors. An evolutionary perspective offers a strong theoretical foundation for empirical research on domain-specific approach and

avoidance motivation, and although we have reviewed a number of empirical findings emerging from this perspective, much territory remains uncharted.

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