

Research Article

Peak of Desire

Activating the Mating Goal Changes Life-Stage Preferences Across Living Kinds

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ABSTRACT—*In three studies, we explored the existence of an evolved sensitivity to the peak that would be consistent with the evolutionary origins of many basic human preferences. Activating the evolved motive of mating activates related adaptive mechanisms, including a general sensitivity to cues of growth and decay associated with determining mate value in human courtship. These studies show that priming the mating goal also activates an evaluative bias that influences how people evaluate cues of growth. Specifically, living kinds that are immature or past their prime are devalued, whereas living kinds that are at their peak become increasingly valued. Study 1 establishes this goal-driven effect for human stimuli indirectly related to the mating goal. Studies 2 and 3 establish that the evaluative bias produced by the activated mating goal extends to living kinds, but not artifacts.*

O, my luvè is like a red, red rose,
That's newly sprung in June.

—Robert Burns (1794/1897)

As celebrated in love poems of yore, likening a person to a flower in bloom is a familiar and well-received compliment. But why, in both poetry and everyday language, is the comparison between an attractive person and a flower at its fullest blossom? We suggest here that the fascination with the “peak stage” of a living kind is a by-product of a deeply rooted, evolved mating motive: Because human mate value is based in part on the age of a potential mate, *sensitivity to the peak* is paramount.

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WHERE DO PREFERENCES COME FROM?

The existence of an evolved sensitivity to the peak is consistent with the hypothesized origins of many basic human preferences. Taking a functional approach to attitudes and their formation (Katz, 1960), we consider the adaptive nature of human preferences. In general, these preferences are a function of adaptation, such that, in large part, people's present-day likes and dislikes are built upon those that served functional ends, particularly long ago in the evolutionary past (Campbell, 1974). Thus, people are predisposed to prefer those stimuli that tend to facilitate their goal pursuits and otherwise produce adaptive outcomes (e.g., Cosmides & Tooby, 1992; Neuberg, Kenrick, Maner, & Schaller, 2004). These evolved predispositions serve as “shortcut processes” and spare each individual from having to figure out each and every time which things are good and helpful and which things are dangerous and unhelpful (Campbell, 1974).

The human preferences of today are influenced by evolved evaluative mechanisms that had been associated with greater survival success in ancestral environments. For instance, people exhibit chronic sensitivity to cues of physical danger that their ancestors encountered, such as snakes and spiders, but lack an innate fear of greater, modern dangers, such as firearms and automobiles (Öhman & Mineka, 2001). This state of perceptual readiness and functional preference is thought to facilitate an organism's survival during critical situations (Dijksterhuis & Aarts, 2003).

One way in which humans maintain such functional perceptual readiness is through neural systems that are specialized for processing domain-specific information (e.g., knowledge about tools and animals; for a review, see Caramazza & Mahon, 2003). One important domain of information is that of living organisms (vs. nonliving objects), and recent research indicates that humans have evolved a core mental module specialized for interacting with living kinds (e.g., Medin & Atran, 2004). For example, young children easily develop the understanding that

plants and animals receive sustenance from the environment that helps them grow, but do not apply this knowledge to non-living things (Inagaki & Hatano, 2003), and changes to living things within briefly presented naturalistic scenes tend to be noticed, whereas changes to inanimate objects in such scenes are not (New, Cosmides, & Tooby, 2007).

In this article, we focus on another facet of the evolved perceptual readiness for interacting with living kinds, namely, the evolved sensitivity to a living kind's age-related peak. We conceptualize the peak as the apex in the life-span development of a living kind (e.g., the ripe fruit, the strong and healthy animal, the newly blossomed flower), as perceived by a human being. Peak stage is loosely identifiable in many living kinds as the life stage following adolescence and prior to senescence.

The shortcut process of being sensitive to the peak of a living kind would facilitate the successful pursuit of several basic evolutionary goals. For instance, being able to recognize the state of an unripe or a rotten fruit is advantageous for a creature who desires to eat. Discriminating whether a competitor is at its peak stage (or which one among several competitors is closest to its peak) would be beneficial in deciding whether to compete or to protect oneself against the threat; likewise, being able to discern immature and past-prime (and therefore most vulnerable) prey would be advantageous for predators on the hunt (Kunkel, Ruth, Pletscher, & Hornocker, 1999).

Research suggests that a sensitivity to the peak is particularly functional for human mate selection. Relative position in the life span is strongly related to fertility and therefore is a very important evaluative feature for people's evolved mating preferences (Kenrick & Keefe, 1992). Natural selection has encouraged this pursuit of partners at their peak mate value through an evolved sexual preference for signs of nobility over signs of prematurity or advancing age (Kenrick, Gabrielidis, Keefe, & Cornelius, 1996; Kenrick & Keefe, 1992; Symons, 1995). As a result of the relationship between physical attractiveness, on the one hand, and good genes and physical health, on the other (Gangestad & Simpson, 2000), markers of physical attractiveness—including healthy flesh tone, unblemished skin, and symmetry (Symons, 1995)—may also serve as heuristic cues that provide information about the value of living kinds in general.

The research we discuss here focused on the mating goal as one of the ways through which evolved shortcut processes affect present-day evaluations of living kinds. We hypothesized that activating the evolved motive of mating (i.e., reproduction) should activate related adaptive mechanisms, including a general sensitivity to cues of growth and decay. Specifically, we predicted that under the influence of the mating goal, people will (a) devalue nonpeak stages of living kinds, while (b) maintaining and even increasing their positivity toward the peak stage.

Previous research supports our hypothesis that activation of the mating goal will activate functional preferences. Mating goals can be activated nonconsciously (e.g., through priming manipulations; see Bargh & Chartrand, 2000) to drive the se-

lective processing of social information (Neuberg et al., 2004) and activate perceptions, cognitions, and behaviors thought to facilitate reproductive success (Griskevicius, Cialdini, & Kenrick, 2006; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Maner et al., 2005; Roney, 2003). For instance, compared with males and females who did not receive a mating-goal prime, only males who viewed a movie about two people on a date were subsequently more likely to project sexual arousal onto the faces of attractive women (Maner et al., 2005).

It remains to be demonstrated whether the incidental activation of innate mating goals does indeed influence people's sensitivity for the peak of nonincentive stimuli (their evaluations of people in a mating-unrelated context and of nonsexual objects). Such findings would further knowledge concerning evolved motives and functional preferences, the boundaries within which stimuli are relevant to goal pursuit (Higgins, 1996), and how people understand and evaluate living kinds.

Recent research suggests that goals, once active, operate autonomously, in an open-ended fashion, on any and all relevant information in the environment—even on stimuli that were not the original intended focus of the goal pursuit (Bargh, Green, & Fitzsimons, in press; Bargh & Huang, in press). For example, the conscious goal of evaluating someone for a particular job opening also influences evaluations of other people who are incidentally encountered at the same time. Therefore, if the mating goal activates (as a necessary means or component subprocess; see Kruglanski et al., 2002; McCulloch, Ferguson, Kawada, & Bargh, in press) a subgoal or module specializing in detecting, through directed perceptual and attentional sensitivity, the life-span peak of the living kind under scrutiny, then the active mating goal could affect evaluation of all living kinds, not just potential mates.

To investigate this issue, we examined whether the mating goal activates general preferences for living kinds at the peak of their life spans. We predicted that when this goal is active, living kinds that are immature or past their prime will be relatively devalued, whereas living kinds that are at their peak will be more positively valued. In three studies, we manipulated activation of the mating goal and then observed its effects on evaluations of living kinds at various stages in their life spans. This design allowed us to examine our predicted effects at specific life stages. Study 1 examined the effects of the active mating goal on the evaluation of fellow humans in domains unrelated to the mating goal. Study 2 extended this examination to evaluation of a nonhuman, asexual object (fruit). Study 3 compared the effects of the active mating goal on evaluations of organic versus inorganic objects (a flower vs. a car).

STUDY 1

Method

Fifty-five undergraduate students (34 females, 21 males) agreed to participate in the study in exchange for candy. They ranged from 18 to 58 years of age, with a mean age of 22.13 ($SD = 6.86$).

One half of participants were randomly assigned to the mating-goal condition. We adapted the mating-goal prime from Maner et al. (2005). Specifically, participants read a 184-word passage describing a romantic date (adapted from the book *See Jane Date*, by Senate, 2001). The other half of participants were assigned to the neutral condition and read a passage describing the interior of a building.

Next, participants read a quote from a movie director about the actress Jane Withers: “She effortlessly lit up the screen with her performance. This was recognized in the positive reviews of the movie, and specific mentions of her appeal.” Participants then viewed four black-and-white photographs of the actress at different stages of her acting career (presented from left to right: toddler, teen, young adult, older adult). Below each photograph, participants indicated on a 10-point scale (1 = *not at all likely*, 10 = *extremely likely*) the likelihood that the flattering quote referred to her at that particular stage of her career. Afterward, participants were probed for suspicion of the hypothesis using the funneled debriefing technique (Bargh & Chartrand, 2000).¹

Results

We conducted a 2 (priming: mating goal, neutral) \times 4 (life stage: toddler, teen, young adult, older adult) mixed-model analysis of variance (ANOVA), with priming as a between-subjects factor and life stage as a within-subjects factor. As predicted, the analysis revealed a significant Priming \times Life Stage interaction, $F(3, 159) = 3.15, p < .05, \eta_p^2 = .06$. Figure 1 shows the devaluation of nonpeak stages in the mating-goal condition relative to the neutral condition. The difference between the rated likelihoods that the flattering quote referred to the actress in her toddler stage versus her teen stage was greater for participants in the mating-goal condition than for participants in the neutral condition, $F(1, 159) = 9.15, p < .005, \eta_p^2 = .15$. In addition, participants who were primed with the mating goal rated the quote as significantly less likely to refer to the actress in her toddler stage ($M = 3.37, SD = 2.24$), compared with participants in the neutral condition ($M = 5.18, SD = 2.67$), $t(53) = 2.72, p < .01, p_{rep} = .95, d = 0.74$.²

The pattern of results indicates that when evaluating a movie actress across her lifelong career, participants with an active mating goal were influenced by her life stage to a greater extent than were control-group participants.

STUDY 2

Study 1 provided initial support for the hypothesized general effect of active mating goals on preferences, by examining

¹No participants in this study or either of the two that follow indicated any awareness of the experimental hypotheses.

²It is reasonable to suspect that participants' gender might have moderated the effects of our manipulations; however, none of the significant findings reported in Studies 1 through 3 were moderated by gender, all $F_s < 1.66, p_s > .19$.

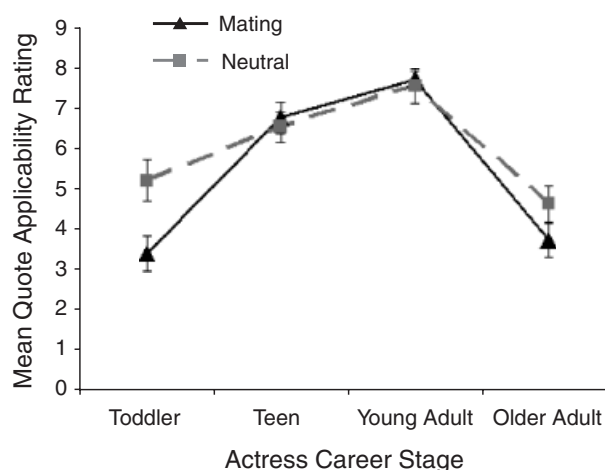


Fig. 1. Results from Study 1: mean rating of the applicability of the quotation as a function of career stage, in the mating-goal and neutral conditions. Error bars indicate standard errors of the means.

evaluations of a fellow human in a domain unrelated to mating. In Studies 2 and 3, we sought to extend the evaluative preference-for-the-peak effect to nonhuman and nonincentive living kinds. Study 2 tested the hypothesis that participants primed with a mating goal would evaluate any living kind (e.g., a piece of fruit) as a function of the current stage of its life trajectory.

Method

Thirty-four participants (28 females, 6 males) recruited from a public-forum Internet Web site agreed to complete the study in exchange for the chance to win a \$50 lottery. They ranged from 18 to 63 years of age, with a mean age of 32.73 ($SD = 12.12$). One half of participants were randomly assigned to the mating-goal condition and read the same mating-goal prime used in Study 1; the other half of participants were assigned to the neutral condition and read a passage describing the interior of a building. After reading the assigned passage, participants viewed a row of four color photographs, representing the progressive life-stage development of a bunch of bananas (new, developing, peak, decaying). The new bananas were green, the developing bananas were yellow-green, the peak bananas were completely yellow, and the decaying bananas featured mottled brown spots. Directly below each photograph, participants rated the attractiveness of the fruit at that stage, using a 10-point scale (1 = *not at all attractive*; 10 = *extremely attractive*).

Results

We conducted a 2 (priming: mating goal, neutral) \times 4 (life stage: new, developing, peak, decaying) mixed-model ANOVA, with priming as a between-subjects factor and life stage as a within-subjects factor. The data revealed a significant interaction, $F(2.65, 84.68) = 3.18, p < .05, \eta_p^2 = .09$ (see Fig. 2). Results were consistent with those of Study 1: Participants primed with the mating goal indicated less liking for nonpeak stages relative

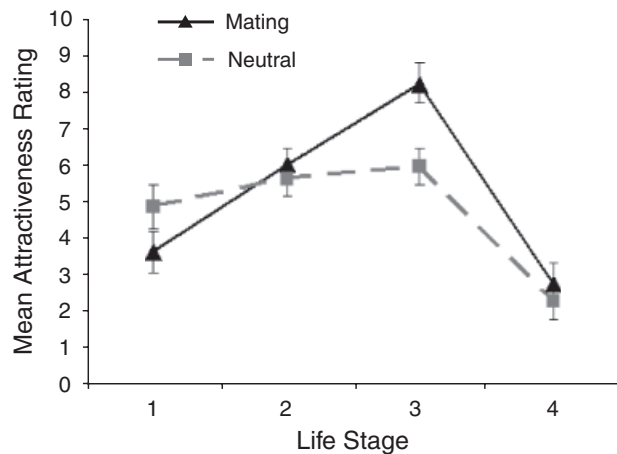


Fig. 2. Results from Study 2: mean attractiveness rating as a function of the bananas' life stage, in the mating-goal and neutral conditions. Error bars indicate standard errors of the means.

to the peak stage. Decreased liking for the new bananas relative to the developing bananas was greater for participants in the mating-goal condition than for participants in the neutral condition, $F(1, 84.68) = 5.46, p < .05, \eta_p^2 = .15$. The data also revealed that mating-goal-primed participants rated the bananas in their peak stage as significantly more attractive ($M = 8.18, SD = 2.40$) than did participants in the neutral condition ($M = 5.94, SD = 2.11$), $t(32) = 2.88, p < .01, p_{rep} = .96, d = 0.99$.

STUDY 3

Study 3 provided a further test of our hypothesis by comparing the effect of the mating prime on evaluations of living kinds versus artifacts. We hypothesized that participants primed with a mating goal would evaluate another living kind (a flower) in accordance with its life stage, but that this effect would not be present when they judged a nonliving thing—that is, an artifact (an automobile).

Method

Ninety-five participants (71 females, 20 males, 4 not reported) recruited from a public-forum Internet Web site agreed to participate in the study in exchange for the chance to win \$50 in a raffle. They ranged from 18 to 60 years of age, with a mean age of 32.40 ($SD = 10.00$). The procedure was similar to that of the previous studies. As in Studies 1 and 2, half the participants were randomly assigned to read the mating-prime prime, and half were assigned to read the neutral prime. After exposure to the primes, participants viewed a row of four color photographs featuring either a flower or a car (from left to right: new, developing, peak, decaying). The new flower was a bud, the developing flower featured halfway opened petals, the peak flower was fully blossomed, and the decaying flower had wilted petals. The new car was a basic automotive frame, the developing car

was almost built, the peak car was fully built, and the decaying car was discolored with advanced age. For each of the four photographs, participants rated the attractiveness of the object, using a 10-point scale (1 = *not at all attractive*, 10 = *extremely attractive*).

Results

To examine the hypothesis that the mating goal differentially affected evaluations of living kinds versus artifacts, we analyzed the flower and car data simultaneously in a 2 (priming: mating goal, neutral) \times 2 (stimulus type: living kind, artifact) \times 4 (life stage: new, developing, peak, decaying) mixed-model ANOVA, with priming and stimulus type as between-subjects factors and life stage as a within-subjects factor. The analysis revealed the predicted three-way interaction, $F(2.33, 211.64) = 4.94, p = .005, \eta_p^2 = .05$. As we were interested in the differential effects of the goal prime on attractiveness ratings for living kinds versus artifacts, we analyzed this three-way interaction in terms of separate Priming \times Life Stage interactions for the flower (living) and the automobile (nonliving) stimuli.

For the flower stimuli, the simple Priming \times Life Stage interaction was reliable, $F(2.55, 122.28) = 4.64, p < .01, \eta_p^2 = .09$. The pattern of means across the life stages closely resembled the pattern of goal-activated evaluative bias found in Studies 1 and 2. The new flower was rated as marginally less attractive by goal-primed participants ($M = 3.78, SD = 2.36$), compared with neutral-primed participants ($M = 5.00, SD = 2.11$), $t(48) = 1.92, p = .06, p_{rep} = .86, d = 0.55$. In addition, type of prime altered relative evaluations of the developing flower and the peak flower. Participants primed with the mating goal rated the developing flower as less attractive than the peak flower to a greater extent than did participants in the neutral condition, $F(1, 122.28) = 5.06, p < .05, \eta_p^2 = .10$. We also predicted and found a goal-activated preference for the peak flower over the decaying flower: Compared with neutral-primed participants, goal-primed participants liked the peak flower more, $F(1, 122.28) = 9.77, p < .005, \eta_p^2 = .17$. Further, participants primed with the mating goal found the decaying flower significantly less attractive ($M = 2.04, SD = 1.79$) than did participants who received the neutral prime ($M = 3.52, SD = 2.35$), $t(48) = 2.53, p < .05, p_{rep} = .94, d = 0.71$. This pattern of results suggests that goal-primed participants' evaluations of the flower stimuli were driven by life stage to a greater extent than neutral-primed participants' evaluations of the flower stimuli.

As hypothesized, however, the signature preference-for-the-peak pattern was limited to living kinds (see Fig. 3 for differences between evaluations in the two conditions as a function of life stage and stimulus type). The Priming \times Life Stage interaction was nonsignificant for the automobile stimuli, $F(2.11, 90.74) = 1.51, p = .23$. Taken together with the significant three-way interaction, the results of the separate two-way interaction analyses suggest that activating the mating goal

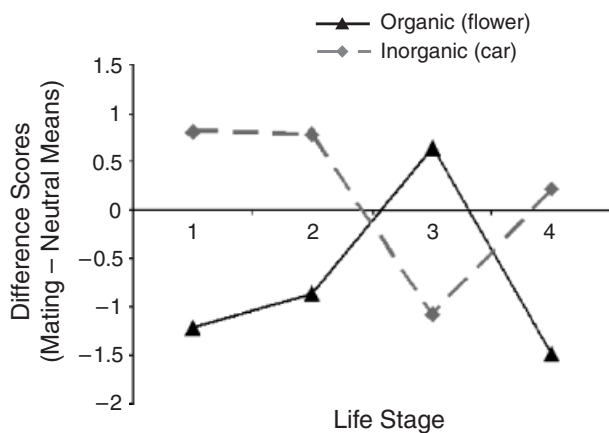


Fig. 3. Results from Study 3: attractiveness difference score (mean attractiveness rating in the mating-goal condition minus mean attractiveness rating in the neutral condition) as a function of life stage for organic and inorganic stimuli.

increases relative preference for the peak among living stimuli, but not among artifacts.

GENERAL DISCUSSION

In three studies, we obtained evidence supporting the hypothesis that activation of the mating goal influences evaluations of living kinds across their life span. Participants who were primed with the mating goal were more likely to evaluate living kinds according to their relative age than were participants who received the neutral prime. These goal-activated effects on evaluation are analogous to age preferences in human mate selection (Kenrick & Keefe, 1992); in both cases, living kinds at their peak are valued more than living kinds that are immature or past their peak.

The findings from Studies 2 and 3 replicated the relationship between the mating-goal prime and age-based preferences observed in Study 1, and confirmed that activating the mating goal affects judgments of living kinds, but not artifacts. In addition, these studies established that the effects of the mating goal generalize not only to judgments of people outside the mating context, but also to nonincentive stimuli such as flowers and fruit. In all three studies, activating the mating goal resulted in stronger relative preferences for the peak life stage, mainly through decreasing absolute preferences for the nonpeak life stages, although increased absolute preference for the peak was observed in Study 2. At this point, we can only ascribe such variations in the absolute level of the effect to the different types of stimuli used in the three studies; our model makes only relative predictions under the assumption that these are what matter in characterizing people's preferences among a limited set of currently available alternatives.

The results support our hypothesis that the evaluative reach of the activated mating goal extends to living kinds unrelated to satisfaction of that goal. Of course, alternative causal directions

are possible and cannot be ruled out on the basis of our initial studies. For example, it is possible that an evaluative mechanism evolved for purposes of detecting the most nutritious among available fruits and other foods, and that the mating goal has co-opted this mechanism for its own purposes. Additionally, the present findings are consistent with an alternative model in which priming of the mating goal produces an increased focus on the hedonic value of a stimulus, rather than on its perceived stage of life. Note, however, that our sensitivity-to-the-peak model predicts effects in nonhedonic realms as well (e.g., quick detection of the most potentially threatening person or animal). These various possibilities could be fruitfully addressed in further research.

The present findings also have some important theoretical implications. First, we have shown that activating an evolved social motive (mating) influences evaluation and preferences beyond the interpersonal domain, affecting evaluation and preferences concerning living things more generally. Second, this research supports broadening the concept of domain-specific modules to include computational mechanisms that can be co-opted or used by multiple motives and goals (see Barrett & Kurzban, 2006; Shepard, 1992), in addition to including an evolved mechanism specialized for detecting growth and decay in living kinds.

Being compared to a flower in bloom is indeed a compliment when the comparison comes from a lover. In an unrelated domain such as career ability, however, activated age-related biases are not always so positive. We posit that a mating-activated sensitivity to the peak is deep-seated in humans' evolutionary past, having evolved for adaptive reasons. In its current-day context, however, this evolved goal and its supporting mental machinery are quite capable of unconsciously biasing judgments of living kinds across a variety of domains.

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