

Evolution and consumer behavior

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An evolutionary theoretical approach considers the adaptive function of behavior. This article discusses what it means to use an evolutionary approach to generate predictions, and discusses two specific evolutionarily informed theories that have uncovered novel insights into consumer behavior. First, the fundamental motives framework highlights the social challenges faced by our ancestors (e.g., finding mates, avoiding disease) that continue to influence modern consumers in specific and often contradictory ways. Second, the ovulatory shift hypothesis highlights that women experience an increase in mating motivation near ovulation (e.g., increased desire to attract men and outcompete rival women) that has important implications for consumers. An evolution-informed approach can generate new insights about consumer behavior.

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Most people love to eat cake. But, why? One answer is because cake tastes good. This is a proximate explanation that concerns the trigger of a particular behavior. This explanation is important, but it does not address the deeper question of why cake tastes so good in the first place. Here's another answer. An attraction to the sight, smell, and taste of foods rich in sugars and fats helped motivate our ancestors to obtain calorie-dense foods and survive in an environment that was often scarce in calories [1]. Our ancestors who were highly attracted to fatty foods were more likely to obtain them, survive, and pass their taste for cake on to future generations. The result is that it is often hard for us modern day consumers to pass up molten lava chocolate cake regardless of our (ever expanding) waistlines. This is an ultimate explanation that concerns the *adaptive* function of a particular behavior: the general desire to eat more cake than vegetables is an adaptation. This kind of ultimate explanation is central

to the study of consumer behavior from an evolutionary theoretical perspective.

An evolutionary approach dates back to Darwin's theory of natural selection [2]. Natural selection is the process by which biologically influenced characteristics become either more or less common in a population depending on how those characteristics affect an individual's reproductive fitness — the passing of genes on to future generations. Characteristics that enhanced reproductive fitness were passed on to the next generation, whereas those that impeded it were not. Natural selection therefore maintains particular characteristics because they have (or once had) fitness benefits. Natural selection produces characteristics that fall in one of the following categories:

- *Adaptations*: characteristics that reliably solved adaptive problems better than competing alternatives during evolutionary history (example: fear of poisonous snakes).
- *By-products*: artifacts without adaptive value that persist because they are inherently coupled with adaptations (example: fear of harmless snakes).
- *Noise*: variations in a given characteristic that are due to random environmental events or genetic mutations (example: most rare types of fears, such as fear of flowers).

Some scholars assume that a few human behaviors might be related to evolution, but that many others are probably unrelated to evolution. This assumption is false. The vast majority of behaviors *include* an evolutionary explanation that falls in one of the three categories above. Even learned behaviors that have a cultural component are not devoid of evolution. For example, even cultural differences in personality are often linked to evolutionarily crucial ecological circumstances such as disease prevalence in a given part of the world [3]. Likewise, any behaviors that are learned also include an evolutionary component because the apparatus doing the learning (the brain) is composed of evolved mechanisms [4–6].

Another misconception is that an evolutionary perspective relies on one single theory — evolutionary theory. This is also false. Instead, natural selection is a meta-theory that encompasses hundreds of different theories such as the theory of reciprocal altruism, parental investment theory, kin selection, and many others [7,8]. These specific theories can suggest specific hypotheses about causal processes of behavior at the psychological level, as we discuss in detail later. Thus, an evolutionary approach

to the study of consumer behavior is an evolutionarily informed psychological investigation.

Considering theories of selection and the adaptive function of behavior provides deeper insight into the psychology behind consumer preferences and choice, which can lead to novel predictions that may not have been generated through any other lens ([7–11], see also [12]). In this review we describe two evolutionarily informed theories — the fundamental motives framework and the ovulatory shift hypothesis — and highlight recent findings generated from them that are particularly relevant to consumer behavior.

Fundamental motives framework

When people think about ‘evolutionary success,’ they may think only about survival and reproduction. Although these are important, there are a number of distinct evolutionary challenges that had to be surmounted to achieve reproductive success. Like all other animals, at a base level our ancestors needed nourishment and shelter. But because humans are intensely social animals, we also faced a set of central and recurrent social challenges [10–14,15**]. These fundamental ancestral challenges included: (1) evading physical harm, (2) avoiding disease, (3) making friends, (4) attaining status, (5) acquiring a mate, (6) keeping a mate, and (7) caring for family. See Figure 1.

The fundamental motives framework maintains that the specific ancestral social challenges faced by humans map onto fundamental motivational systems that function to help solve each challenge. Activating a particular fundamental motivational system produces a specific set of

consequences for attention, memory, cognition, and preferences [15**,16,17]. This coordinated cascade of responses functions to solve the ultimate problem associated with the currently active system.

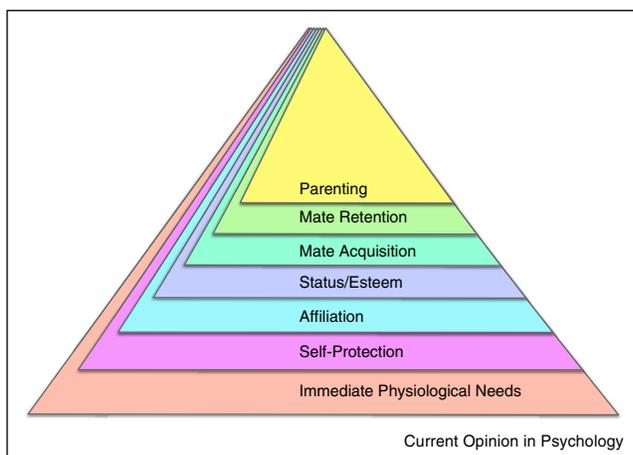
A fundamental motive can be activated or primed by external or internal cues indicating threats or opportunities related to a specific evolutionary challenge [15**]. For example, the mate acquisition system can be activated by interacting with a desirable member of the opposite sex, being in the same room with such a person, being exposed to an image involving such a person, or merely imagining a desirable romantic encounter. Consistent with the fundamental motives framework, the activation of the mate acquisition system leads a person to prefer and seek products that facilitate achieving the ultimate need of acquiring a mate.

For men, acquiring a mate often means spending current resources in ways to attract the attention of the opposite sex. For example, two studies found that having men handle sexy lingerie or read a story about a surplus of men competing for women’s attention activates the mate acquisition system, which in turn leads men to report an increased desire for immediate versus delayed monetary rewards [18*,19*]. Activating the mate-acquisition system can also erase loss aversion [20*]. In fact, for men, triggering the motive to attract a mate can cause this bias to reverse itself, leading gains to loom larger than losses. Similarly, photographs of attractive members of the opposite sex and imagining a romantic encounter with an attractive partner leads men to spend more on conspicuous luxury products [21,22].

What about women? Mate acquisition motives do not lead women to spend more on conspicuous luxury goods. And for good reason; flaunting a flashy designer handbag has rarely been an effective way to attract a man. Yet, we know that women spend a lot of money on conspicuous luxury goods. This opens up the possibility that a different fundamental motive may underlie women’s conspicuous consumption. In a quest to find an answer to this puzzle, a series of studies activated in women the *mate retention* system (i.e., a motive to guard a partner from rivals who want to steal him). When this system was activated, women had an increased desire to acquire luxury goods [23*]. This finding suggests that women may use luxury products to signal status and intimidate other women.

An important implication of the fundamental motives framework is that the same person might make different — and sometimes entirely inconsistent — choices depending on which fundamental motive is currently active, as is the case for women when the mate acquisition versus mate retention system is activated. This is because what constitutes adaptive behavior to further

Figure 1



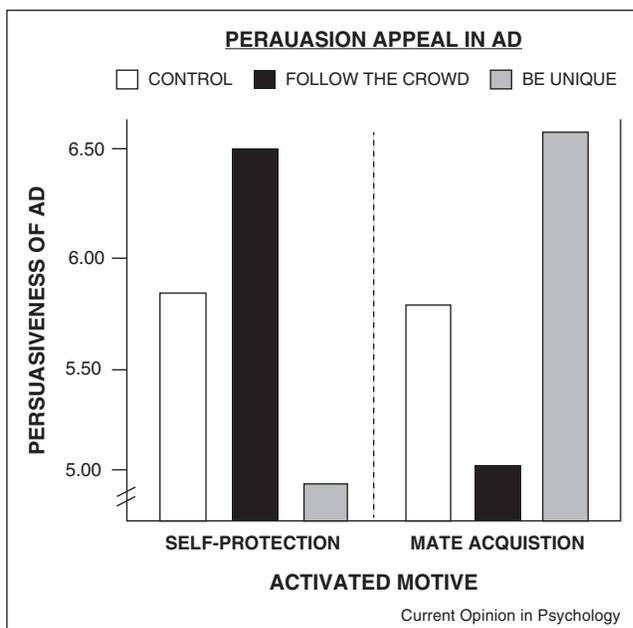
Hierarchy of fundamental human motives [13]. Note — once a motivational system has developed, its activation can be triggered in response to environmental cues indicating a threat or opportunity related to a specific evolutionary challenge.

one ultimate need (e.g., attracting a mate) may be very different from — and sometimes even completely opposing to — what is adaptive to further another (e.g., avoiding disease). As an example, activating the self-protection system leads people to conform and follow the masses [24]. When this motive is active, such as when watching a crime-filled television program, people are more attracted to products advertised as best-selling and popular, while being less attracted to the same products when they are advertised as unique and different [25**]. Like wildebeests in the presence of a leopard, cues of physical threat motivate people to be part of a larger group.

By contrast, activating the mate acquisition system leads people to want to stand out from the crowd. When this motive is active, such as when watching a romantic or sexy program, people are more attracted to products advertised as unique and different, while being repulsed when the same products are advertised as popular or best-selling [25**]. Like an animal on the prowl looking to put on a display for a mate, cues of potential mates motivate people to stand out. See Figure 2.

In summary, the fundamental motives framework highlights the adaptive social problems that the mind is geared to solve. It then shows how, why, and when people's preferences and behavior change depending on which adaptive problem they are currently seeking to solve.

Figure 2



Effectiveness of persuasion appeal as a function of elicited fundamental motive (through movie clip; [23*], Study 1).

Ovulatory shift hypothesis

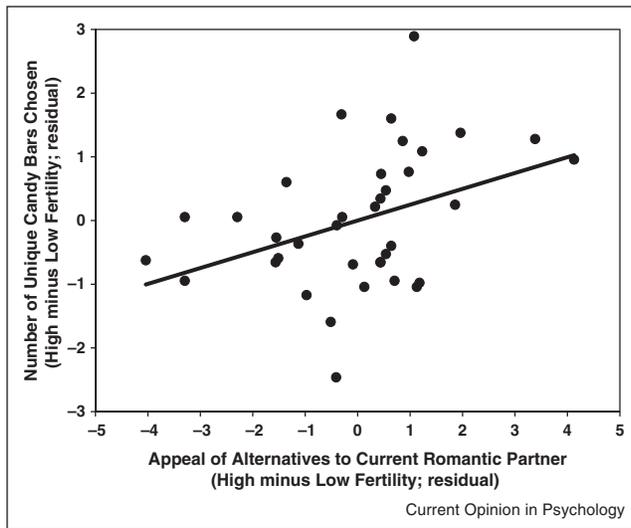
Most women experience an ovulatory cycle that spans on average 28 days. And, unlike men, women's sexual behavior can result in pregnancy only near ovulation (days 8–14 of the cycle). The ovulatory phase is characterized by a steep increase in the ovarian hormone estrogen, which triggers the release of a single sex cell known as an ovum or egg [26,27]. Because over evolutionary history women could only reproduce when they ovulate, women's motivations and behavior evolved to adaptively shift specifically at this time. This notion is known as the ovulatory shift hypothesis [28–31].

The ovulatory shift hypothesis posits that women should experience a shift in mating-related motivation and behavior near ovulation [28,32]. Supporting this notion, research has since found that women experience an increase in sexual desire near ovulation specifically toward men who possess indicators of genetic fitness such as facial symmetry and attractiveness, masculinity, and social dominance [28,32–37,38*].

If women are more motivated to achieve goals related to mate attraction near ovulation, might ovulation have an impact on women's consumer choices? Drawing on the ovulatory shift hypothesis, recent research examined whether women have an increased desire for variety in men at ovulation and whether this would carry over to desire for variety in consumer products [39**]. A desire for variety (i.e., a desire for more mating options to compare, contrast, and explore) could facilitate the search for a genetically fit partner. Consistent with this idea, women experienced an increase in desire for variety in men near ovulation (compared to a low fertility point in the cycle) that was positively correlated with a desire for variety in consumer products such as candy bars. The correlation is computed as the difference in desire for variety as women move from a low-fertility to high-fertility point in the cycle. See Figure 3. This hormonally regulated effect on variety seeking was found for other products (e.g., restaurants, shoes, and nail polish) and was mediated by mate attraction motives triggering a variety-seeking mindset. For women in relationships, the effect was weaker for women strongly bonded to their partner, suggesting that loyalty to a mate may carry over to brand loyalty.

Because mating motives involve not only mate attraction but also competition for access to mates, research has also examined whether heightened competitive motives near ovulation impact consumer choice. One way women compete with one another is through their choice of dress and ovulation has been shown to have a considerable effect on women's desire to dress in sexier outfits [40,41*]. Whether women are selecting outfits directly from their own closet, drawing a desired outfit on a paper doll, or selecting clothing from a fashion website, women consistently choose outfits that are sexier, more fashionable, and

Figure 3



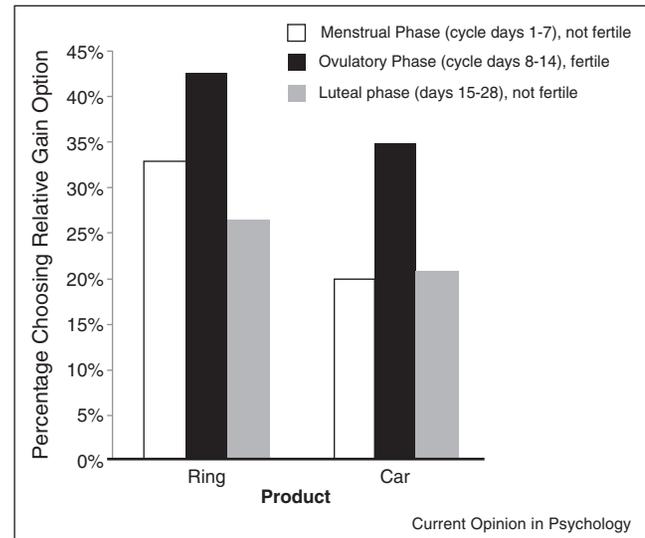
Desire for variety in mate choice near ovulation (high minus low fertility) correlates positively with the number of unique candy bars chosen near ovulation (high minus low fertility; [37], Study 2).

more revealing near ovulation [40,41*,42,43]. Ovulation has the strongest effect on women's desire for sexier clothing when women know that there are many other attractive women in their local environment [41*]. That is, when there is lots of competition for mates.

The ovulatory shift in competitive motivation does not just lead women to want to look sexier than their rivals, it also motivates them to outcompete other women for status and access to the best men available. In one study, ovulating and non-ovulating women made product choices that could either maximize absolute gains or maximize gains relative to other women [44**]. The findings showed that ovulation made women more competitive with regard to other women. Near ovulation, women were willing to accept lesser versions of a product (a \$5000 diamond ring in lieu of a \$7000 diamond ring) as long as they had better products than other women. See Figure 4. And, ovulating women kept more money for themselves in the Dictator Game rather than give it to another woman.

In summary, similar to the effects of testosterone in men, the hormones that regulate fertility drive women's preferences and behaviors [35,45–47]. In addition to hormones regulating fertility, there are various other hormones that influence people's behavior in other domains [48]. For example, cortisol drives our responses to stressful situations [49], and oxytocin and vasopressin drive our desire to bond with family and friends [50]. Each of these hormones is likely to influence consumer behavior in important ways. Understanding how

Figure 4



Percentage of women selecting the product that provides a relative gain rather than an absolute gain as a function of phase in the ovulatory cycle ([42], Study 1).

hormones influence behavior provides a unique window into the psychological underpinnings of consumer behavior.

Conclusion

Human behavior includes an evolutionary explanation, including consumer behavior. An evolutionary psychological perspective focuses on ultimate explanations, asking about the adaptive function of behavior (i.e., how a given behavioral tendency would have helped our ancestors solve adaptive challenges), and drawing on theories of selection to generate predictions. Novel insights into consumer behavior are being uncovered as more scholars adopt an evolutionarily informed research program [51,52*,53–60].

Charles Darwin wrote that, 'In the distant future, I see open fields for more important researches. Psychology will be based on a new foundation' [2]. Although it took over 150 years, Darwin's vision is beginning to be realized. There are many questions left to ask and much new knowledge to be gained by examining consumer behavior through an evolutionary lens. As the bridge between the natural and social sciences becomes stronger, future generations of researchers are poised to build a truly inter-disciplinary science of consumer behavior.

Conflict of interest statement

The authors wish to confirm that there are no known conflicts of interest.

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