Intuitive Evolutionary Perspectives in Marketing Practices

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RUNNING HEAD: Intuitive Evolutionary Perspectives

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1 Portions of this paper are drawn from Colarelli (2003) and Colarelli, Alampay, and Canali (2002a).
Abstract

Firms spend considerable sums of money on marketing, and they continue to do so because marketing works. However, marketing can only work if marketers have a reasonably accurate view of human nature. We argue that many consumer products and advertisements reflect an accurate view of human nature, a view that is compatible with the tenets of evolutionary psychology. Implicit theories of human nature that are out of synch with reality sell few products. We provide an overview of an evolutionary perspective on marketing and examine connections between marketing practices and evolved adaptations, including kin selection, prestige seeking, preferences for salt, sweets, and fat, and savanna-like landscapes. We also examine adaptations that differ by sex and how they are mirrored in marketing. Finally, we discuss some marketing practices reflect evolutionary principles of variation.
Although the relationship between academic psychology and marketing has a long and mutually beneficial history (DiClemente & Hantula, 2000), the practice of marketing – particularly advertising and product development – suggests a curious paradox. For most of the 20th century an evolutionary perspective was almost absent in academic psychology; yet during the same period, many consumer products and appeals used in advertising reflected an implicit view of human nature similar to that articulated by evolutionary psychology, which emerged only recently. The purpose of this article is to draw attention to connections between an evolutionary perspective and marketing practices. We hope that this will pique scholars’ and professionals’ interest in evolutionary perspectives, encourage more formal applications of an evolutionary perspective in marketing, and generate a greater interplay between marketing and an evolutionary-oriented psychology. Finally, we hope that drawing attention to these connections may stimulate evolutionary psychologists to look at marketing practices as sources of data.

Unlike Saad and Gill (2000) who examined explicit, explanatory paradigms used in the marketing literature and argued that few marketing scholars use an evolutionary psychological framework, we are concerned with implicit views of human nature, how they mirror evolutionary psychological thinking, and how marketing practices reflect these views. We begin by providing a brief overview of an evolutionary perspective on marketing. We then examine connections between marketing practices and evolved human adaptations, such as prestige seeking and preferences for sweets, fat, and salt. Finally, we discuss how some marketing practices reflect evolutionary principles of variation.
An Evolutionary Perspective

Evolutionary theory views the development of biological and social systems as occurring through a process of variation, selection, and retention—occurring through a slow process of small incremental improvements, rather than through a priori design (Dennett, 1995). It is primarily concerned with "why" and "function" questions. Why do humans prefer foods that are salty, sweet, and have a high fat content? What are the possible adaptive functions of those preferences? The primary processes in biological and social evolution are natural selection and sexual selection.

Darwin formulated three postulates of natural selection (Darwin, 1859), which we modified slightly so that they are applicable to both biological and cultural evolution. The first postulate is that without constraints, populations can expand indefinitely; however, because resources are limited, the carrying capacity of an environment to support any population is limited. The second is that the units in a population, such as organisms or social structures, vary; that is, they differ in slight ways from one another. These variations affect the ability of units to survive and replicate. The third postulate is that many, but not all, variations are transmitted from generation to generation. Variations that are associated with successful consequences, regardless of initial intentions, are usually retained.

Darwin also proposed a theory of sexual selection (Darwin, 1871), although refinements and implications of it were not developed until over a century later (Cronin, 1991; Miller, 2000). Traits evolve for different reasons under natural or sexual selection. With natural selection, traits evolve because they are directly related to survival and reproduction: for example, the osprey’s talons, the rabbit’s running speed, and nurturing
behaviors that female mammals exhibit towards their young. With sexual selection, traits evolve because they are attractive to the opposite sex (Cronin, 1991). A classic example is the peacock’s tail. It does not directly help the peacock survive and reproduce; in fact, it is an encumbrance when peacocks are escaping from predators. However, a large, colorful tail is attractive to peahens because it is a sign of health and genetic vigor. Peahens are, therefore, more likely to mate with peacocks with large, colorful tails.

Sexual selection can also occur in social systems, where the criterion for replicating a social process or artifact is its capacity to attract members of the opposite sex (Miller, 2000). Sexually selected social practices probably include displays of musical talent, athletic prowess, poetry, repartee, and sartorial fashion.

The evolutionary perspective in the social sciences contains two broad sub-perspectives: evolutionary psychology and cultural evolution.

*Evolutionary psychology.* Evolutionary psychology is a synthesis of modern psychology and evolutionary biology. It uses the logic of natural selection to examine human mental processes and behavior. Two assumptions of evolutionary psychology are: (1) that the human mind is modular, consisting of numerous psychological mechanisms and (2) that these mechanisms are adaptations. An adaptation is any feature of an organism that has been important to increasing inclusive fitness, that is, the propagation of genes into future generations, either directly by mating and caring for offspring or indirectly by helping kin survive and reproduce (Williams, 1966, 1996). Adaptations serve a purpose, that is, a function, reflected in *special design* (Williams, 1966). The function of wings on most birds is flight. The function of the eye is to enable an organism to see. The distinguishing features of special design are: functionality,
reliability, complexity, and good design. Psychological mechanisms are heritable, content-specific psychological processes that are activated in specific contexts associated with solving adaptive problems, such as identifying and competing for fertile mates. They are Darwinian algorithms that allow the mind to process information efficiently in contexts where doing so has paid off in the currency of survival and reproduction (Gigerenzer and others, 1999).

Evolutionary psychology is relatively new field; not surprisingly, there is a healthy debate about the nature and number of psychological mechanisms. It is not uncommon to see multiple interpretations of psychological studies with an evolutionary perspective (de Waal, 2002). However, these debates are having the salutary effects of improving theory and evidentiary standards for identifying psychological mechanisms (Andrews, Gangestad, & Matthews, in press; de Waal, 2002). Keeping these caveats in mind, Table 1 provides a provisional list of psychological mechanisms identified with the evolutionary psychological literature.

Insert Table 1 about Here

The mind of present-day humans was shaped primarily during 1.2 million years of the Pleistocene era, when humans lived as hunter-gatherers in Africa. Evolutionary psychologists refer to this as the environment of evolutionary adaptedness (EEA). The human mind is, therefore, not necessarily adapted to industrial and post-industrial society. Moreover, changes in our mental mechanisms occur much slower than changes in culture. Behavioral patterns that are deeply rooted in evolutionary history cannot be
quickly altered by cultural or technological change. Psychological mechanisms influence a range of human behavior, although people are not necessarily conscious them.

Common misconceptions about evolutionary psychology are that it implies that behavior is “genetically programmed” and that it downplays the role of learning. To the contrary, a fundamental premise of evolutionary psychology is the interaction between human nature and the environment. For example, all normally developing humans acquire language. The developmental regularities of language acquisition across cultures are evidence that language is an instinct in humans (Pinker & Bloom 1992). However, the content of language – whether a person speaks French or English – is learned and is a product of culture. Evolution has shaped the ease with which behaviors are learned, the parameters of learning, and the contexts in which they are most readily acquired (Geary, 1995). Similarly, many adaptations are facultative—the phenotype varies depending on environmental conditions to which the organism is exposed (Gaulin & McBurney, 2001).

Cultural Evolution. Cultural evolution is a process whereby social systems and practices develop from variations and by a process of trial and error, rather than through deliberate design (Campbell, 1975; Colarelli, 1998). With cultural evolution, acquired characteristics, such as behaviors and values, are culturally selected and retained (Boyd & Richerson, 1985; Campbell, 1975). Variations can arise through pure chance, improbable combinations, imperfect imitation, and errors; they can also occur through guided evolution (Boyd & Richerson, 1985). Guided evolution is evolution based on forethought. It is the development and introduction of variations based on estimates that some of them will produce desired results. Through cultural selection mechanisms (e.g., imitation), social systems select variations and (usually) retain those that are functional
(Colarelli, 1998). The efficiency of a new social practice does not ensure that social systems will select it and use it. Circumstances must favor its inclusion into a pool of variations, selection mechanisms must capitalize on it, and conditions must favor its retention. Social units can “learn” to use a practice that is invalid for its intended purpose because it produces other functional consequences or is compatible with evolved human preferences.

The evolution of social practices is often a complex interaction of psychological mechanisms, ecological conditions, and cultural transmission. An over-simplified model might look like this: psychological mechanisms influence human decision rules and preferences→ these influence the development of traditions and artifacts→ traditions and artifacts influence survival and reproduction, which influence rates of cultural transmission of traditions and artifacts. For example, like many other animals, humans forage for food and other resources. Given the regularities in foraging behavior among hunter-gatherers, it is a reasonable hypothesis that psychological mechanisms evolved in humans that guide foraging behavior (Rajala & Hantula, 2000; Winterhalder & Smith, 1981). As the consumer society developed, new venues emerged for foraging—shopping areas in cities, malls, and web pages. To some extent, the ancient psychological mechanisms that guided foraging behavior of our ancestors also influenced the shape of new foraging ecologies. Those new ecologies that produced beneficial consequences to human survival and reproduction were more likely to be replicated. This brief example suggests how the development of cultural artifacts (e.g., shopping centers) and traditions (shopping) emerged from the interaction among psychological mechanisms, ecological conditions, culture, and cultural transmission.
Intuitive Evolutionary Thinking in Marketing

Companies spend considerable sums of money on marketing—$320 billion globally in 2000 (Kloss, 2001). They do so because marketing works. Developing new products that meet consumers’ needs can substantially improve a firm’s fortunes. Effective advertising can make the difference between whether consumers ignore a product or buy it. However, for marketing to work, marketers must base their activities on a reasonably accurate view of human nature. What model might they be using? The content of many advertisements and the nature of many consumer products suggest to us that marketing practitioners are using a model of human nature that is implicitly based on evolutionary psychology.

Consumption is a bio-social activity (Sherry, 1991). As such, psychological mechanisms have played an important role in the development of preferences for many consumer products and marketing practices (Burnham & Phelan, 2000). As the consumer culture emerged, marketers tapped into psychological mechanisms in developing products and advertisements. For example, John B. Watson was one of the first psychologists to recognize the importance of emotional appeals in advertising, and he used them in his work in advertising at the J. Walter Thompson agency (Buckley, 1982). Most advertisers, however, probably did not consciously engineer advertisements based on evolutionary principles; rather, advertising appeals emerged from an interaction of psychological mechanisms, ecological conditions, cultural factors, and consequences. Advertisements that appealed to an evolved preference were more likely to produce effective consequences and be adopted. For example, an ad directed to young males that features young and attractive females is likely to get their attention and develop a positive
emotion towards the product. Consumer products and advertisements are likely to tap into evolved psychological mechanisms when they provide information similar to that provided in contexts that gave rise to the evolution of a particular psychological mechanism.

In the following sections we look at how advertising and product development map onto psychological mechanisms. We dichotomize these mechanisms into those that are common to both sexes and those that are characteristic of each sex. Whenever possible, we provide three converging sources of evidence: contemporaneous, historical, and cross-cultural. If a practice is evident over time and across cultures, then it is more likely that the practice is based on an evolved psychological mechanism than on an idiosyncratic feature of culture or history. After drawing connections between marketing practices and psychological mechanisms, we look at how marketing practices reflect the evolutionary principle of variation.

Some Adaptations Common to Both Sexes

Some psychological mechanisms, such as the preferences for savanna-like landscapes or a fear of snakes, are less adaptive to people living in post-industrial consumer societies than to our ancestors who lived as hunters and gatherers in Africa. Others, such as kin-based altruism and status seeking, continue to be adaptive. Still others, such as cravings for fats and sweets, are mismatched to the modern environment because they lead to over-consumption and attendant health problems in resource-rich modern environments. Yet most of our psychological mechanisms elicit strong responses, and these in turn influence our susceptibility to consumer products and advertising.
Kin selection. One of the most powerful psychological mechanisms is kin-selection (Hamilton, 1964). Kin selection is the tendency to behave altruistically to kin, and increasingly so as relatedness increases. Among group-living species, kin selection is a fact of life. The biological puzzle of altruism was solved by William D. Hamilton, in what later become known as Hamilton’s Rule: natural selection will favor individuals who incur costs to help another when it is in their genetic self-interest. For example, natural selection will favor individuals to be twice as altruistic to someone who shares 50% of their genes (say, a child or a sibling) than to someone who shares 12.5% of their genes (a first cousin). Numerous studies have found that genetic relatedness is correlated with altruistic behavior. People are more likely to bequeath their estates to kin than non-kin (Smith, Kish, & Crawford, 1987). Parents typically invest more resources – such as food and health care expenses – in genetic offspring than step, adopted, or foster children (Case, Lin, & McLanahan, 1999, 2000; Case & Paxton, 2001). Kin selection probably influences the purchase of many products that people use to help relatives. These might include toys, child safety products, insurance products, and financial planning services.

Life insurance is an example *par excellence* of kin selection. The primary purpose of life insurance is to financially assist the insured person’s designated beneficiaries, who are typically spouses, offspring, and other kin. Life insurance, particularly term life insurance, provides no tangible benefit to the insured person during her lifetime. Life insurance emerged as a viable consumer product concomitantly with modernization, as extended families diminished and as people became dependent on money for survival. In pre-modern and non-industrialized countries, if an adult with children died prematurely, other family members were expected to take care of the
surviving spouse and children. For example, in some traditional societies it is customary that an unmarried brother marry his deceased brother’s widow (Wilson, 1950/1964). Life insurance is relatively unknown in traditional societies and in developing countries where extended families and limited geographical mobility are the norm. Ninety-six percent of all the life insurance sold in 1997 was sold in Europe, North America, and Asia, while four percent of world sales were in Latin America, Africa, and Oceania (American Council of Life Insurance, 1999).

Life insurers begin targeting consumers when they have their first baby (Grimm, 2002), and advertising copy for life insurance – directed at a wide variety of ethnic groups – typically has a strong emphasis on family and providing for one’s offspring (Barney, 2002; Marketing News, 1986). In 1997, 87% of full-time employees in medium and large private firms in the US received life insurance as part of their benefits package (US Dept. of Labor, Bureau of Labor Statistics, 1997); in 1998, married couples with children were almost twice as likely to own life insurance as people who were unmarried (LIMRA, 2000). The connection between life insurance and kin selection is also apparent in how changing demographics drive new approaches to selling life insurance. As women become co-breadwinners or sole providers for their offspring, insurance marketers increasingly target women (Myers, 1996).

Saving and paying for children’s college expenses is another prominent area of consumer behavior related to kin-selection. In countries such as the United States parents contribute substantially to children’s college expenses. For most intact families with children under 18, saving for their children’s college education is their most important savings goal (DeVaney & Chien, 2002). Parents, along with some help from the students
themselves, contribute about half of the cost of a child’s college education (Gladieux & Hauptman, 1995). Over a typical four-year stint in college, parents in the US contribute about $21,800 for a child attending a public university and $47,300 for a child attending a private university (Vail, 2002). The financial planning and mutual fund industries offer a variety of products for parents to help pay for their children’s college expenses. Many of these are associated with Section 529 of the Internal Revenue code, which gives a tax break for college savings. All 50 states have some sort of 529 plan (usually an annuity or savings plan), and parents and relatives have already saved $21 billion in such plans (Feigenbaum, 2002; Collegesavings.org, 2002). Advertising copy for college savings plans acknowledges the power of kin selection by appealing to the desire of parents and relatives to help with children’s education. For example, the ad copy for the Michigan Educational Savings Program emphasizes that “parents, grandparents, [and] relatives…may open an account and contribute…on behalf of a beneficiary” (MESP, 2002, p. 1; emphasis added).

Consistent with a kin-selection hypothesis, families with two genetic parents contribute more towards college expenses of their offspring than do families with step children. Zvoch (1999) found that step parents began financial planning for college later, set less money aside for college, and spent less per year on educational expenses than two genetic parents. Anderson, Kaplan, and Lancaster (1999) found that compared to stepchildren, genetic offspring of two married parents were more likely to attend college, more likely to receive money for college, and more likely to receive more money. Genetic children of current mates received an average of $4,293, while step children of current mates received an average of $1,828 (in one year in 1990 dollars). Xhosa men in
South Africa also contribute significantly more money to their genetic children’s educational expenses than they do towards their stepchildren’s educational expenses (Anderson, Kaplan, Lam, & Lancaster, 1999). The educational attainment of genetic offspring is also higher than step, foster, or adopted children (Case, Lin, & McLanahan, 2001).

**Status and prestige.** Status and prestige have nearly universal appeal among humans. Status is associated with rank in a hierarchy and greater resource entitlement, which in turn is associated with greater survival and reproductive advantage (Betzig, 1986; Perusse, 1993). Status can be attained by control of economic resources, political or military power, legitimate authority, or by having valued skill and knowledge. Prestige is a particular type of status—the quality of having attained status by skill in a particular domain (Barkow, 1989; Henrich & Gil-White, 2001; Treiman, 1977). Prestigious individuals, therefore, are regarded as possessing socially useful skills and knowledge; they receive deference and entitlements accordingly. Prestige is valued because it is associated with skills that allow people (both males and females) to compete for resource acquisition, which in turn enhances their ability to reproduce and care for offspring (Barkow, 1989). On the other hand, people can attain high status but have relatively low prestige. In this section we will focus on the connection between prestige and marketing because prestige is valued and sought by both males and females. Because status – that is, entitlement to reward based on rank in a hierarchy – is more actively pursued by males, we examine the connection between status and marketing in a later section where we look at adaptive differences between males and females.
People acquire skills and knowledge in a variety of ways – books, lectures, seminars, training programs – but the oldest method has been that of social learning, by imitating skilled individuals. Long before widespread literacy and commercial vocational training, people acquired skills by observing and working with master practitioners (Colarelli, 2003). Even today, one of the most effective methods of acquiring a skill is for an individual to become a member of a community of practice in which he or she can observe and work with more skilled individuals (Colarelli, 2003). In addition to imitating skills, people typically imitate other behaviors of prestigious individuals (Henrich & Gil-White, 2001). The psychological mechanism that predisposes people to imitate high-prestige individuals evolved because it helped to solve the adaptive problem of efficiently identifying and gaining useful skills, values, and beliefs (Henrich & Gil-White, 2001). Because it may not always be possible to identify precisely which behaviors contribute to skill acquisition and prestige, it may have been adaptive to err on the side of excess and copy as many behaviors as possible from prestigious individuals.

Ownership and displays of prestigious consumer goods (i.e., status symbols) are, to some extent, cultural equivalents of the physical traits that biologists call “honest signals.” Honest signals are traits that are difficult to fake. Conspecifics (i.e., members of the same species) use honest signals as evidence of a potential mate’s health, robustness, and genetic quality (Zahavi, 1975). The male lion’s mane, for example, is associated with indicators of health, such as lower parasite counts; female lions preferentially mate with males with full, lustrous manes (Withgott, 2002). Thus, the display of prestigious consumer goods can be a type of honest signal of mate value. A man who wears expensive clothes is signaling to potential mates (and male rivals) about
his resources and skills at acquiring wealth; such men are generally perceived as more attractive by females (Ellis, 1992). Women displaying prestigious consumer goods are also sending signals about their resources and expectations for resources. Consumer goods, however, can be fallible honest signals. A person of reasonably modest means with access to credit can give the impression of having more status than he actually has by going into debt or spending all of his discretionary money on status symbols.

The appeal of prestige is widely used in marketing. Mainstays are products that enhance skills. Self-help books on everything from cooking to romance to management are staples in the marketplace. More than 1,700 business titles were published in 1996 alone (Chadderdon, 1998). Approximately 102 million cooking and crafts books were sold in the United States, accounting for over 10 percent of national book sales (American Booksellers Association, 2002). Books in the “psychology” and “recovery” categories (e.g., family life, love, sex, marriage, diet, health, exercise, and personal grooming) accounted for 6.3 percent of US book sales in 1998.

Normally one achieves prestige through years of hard work. Marketers, however, promote products to create the illusion that consumers can bypass time and effort. They do this with status symbols—artifacts that signal an individual’s prestige or status. Marketers use existing status symbols as well as cultivate new ones. Advertisements coöpt the prestige-imitating mechanism by associating a product with prestige—by portraying a functional relationship between a product and a skill, by associating a product with prestige (without a functional relationship), or by cultivating an image that the product is expensive.
Portraying a functional relationship involves associating the product with skillfulness in a particular domain. A classic strategy is to portray celebrities, known for a particular skill, using the product. IBM has an advertising campaign that portrays celebrity intellectuals using IBM’s laptop computers (Morgan, 2002). Nike ads show celebrity athletes wearing Nike shoes and clothing. The implicit message is that if the consumer uses the product she can be more skillful or at least create a first-impression that she is skillful in a particular domain. Uniliver has successfully used the celebrity-association strategy for Lux soap for years and in many cultures. Among the female celebrities that have appeared in ads for Lux are Joan Collins, Jane Fonda, Audrey Hepburn, Sophia Loren, Elizabeth Taylor, and Raquel Welch (Rijkens, 1992). Lux is Unilever’s premier international brand, and it is a world leader in sales.

The imitation mechanism can also be coöpted by associating a product with a prestigious person even though there is no functional relationship between the product and a skill. This creates an aura of prestige surrounding the product and consumers who buy it. This can be seen in celebrity endorsement of products unrelated to the celebrity’s skill, such as a famous opera singer wearing a Rolex watch. Industry observers attribute the surge in demand for premium cigars to the advertising strategy of associating cigar smoking with an upscale lifestyle (Frank, 1999). “The link is promoted by magazines like Cigar Aficionado, whose covers portray cigar-smoking celebrities such as Arnold Schwarzenegger, Madonna, and Demi Moore” (p. 31). However, cigar makers were using prestige appeal to sell cigars as early as the 19th century (Jones, 1979). For example, one advertisement in 1892 for General Arthur Cigars portrays a young woman dancing in a formal gown, surrounded by men in tuxedos tipping their top hats to her...
Prestige appeal is also common cross culturally. A good example is After Eight chocolate mints. In the 1960’s After Eight sought to internationalize its product. It used a marketing strategy that appealed to prestige (depicting well-heeled people marveling over the product), and the campaign apparently worked. The mints grew in popularity throughout Germany, Holland, Italy, and France (Rijkens, 1992).

Price also signals prestige. Cultivating an image that a product is expensive can increase prestige appeal. Owning and displaying an expensive product can signal that the owner has the surplus resources to buy the product and therefore the skills to acquire substantial resources. Over a century ago the economist Thorstein Veblen (1899/1953) adumbrated the connection between consumer goods and prestige appeal when he coined the term *conspicuous consumption*—the “specialized consumption of goods as an evidence of pecuniary strength.” (p. 60). He also anticipated the notion that a psychological mechanism (“a heritage from the past”) may be responsible for conspicuous consumption (p. 165). Products that are commonly marketed as status symbols are ornaments that are readily displayed, such as jewelry or watches. A $40 Timex wristwatch keeps time just as well as a $14,000 Patek Philippe, but the Patek Philippe signals that its owner has resources and (possibly) the skill to acquire resources. Advertising such status symbols is anything but novel in the realm of marketing. Upscale watches have been marketed as status symbols for decades (Jones 1979) and this continues unabated, as a cursory glance through the pages of most upscale periodicals will attest.

*Preferences for sweets, fat, and salt.* People across the world share preferences for sweets, salt, and fat; they share aversions for foods with a bitter, rancid, or putrid taste.
Intuitive Evolutionary Perspectives

(Rozin, 1976). During the approximately 1.2 million years that humans lived as hunter-gatherers, people evolved a preference for foods with a high nutritional value (Buss, 1995). Protein, carbohydrates, and minerals are essential for nutrition and health. Foods high in fat were the most efficient form of calories and often had high concentrations of protein. Foods that were sweet, such as ripe fruits, generally indicated high levels of nutrients, especially carbohydrates. A salty flavor indicated high mineral content—particularly sodium chloride, a mineral that humans cannot live without (Pocock & Richards, 1999). People who preferred those tastes would be more likely to survive and reproduce than people who had preferences for bitter and putrid foods, which are associated with poisons and rotten food. People’s preferences would motivate them to seek out such foods. However, because they were relatively scarce and difficult to acquire, people could not consume them to excess. In the modern era, fats, sweets, and salt are readily available.

These evolved preferences have played a significant role in the development and advertising of consumer food products. Salt was one of the first commodities and consumer products. Records show that salt was used in trade and in food preparation by the Chinese and Egyptians over 4000 years ago, and salt has remained an essential flavoring and preservative (Kurlansky, 2002). Although people do not experience a craving for salt, they notice its absence and prefer foods with salt. The modern snack food industry capitalizes on humans’ need for salt by creating an array of salty snacks—potato chips, salted nuts, tortilla chips. In 1999, consumers ate 6 billion pounds of salty snacks, with annual sales reaching $19 billion. Potato chips led the pack with $4.7 billion in sales (Howell, 2000). Snack foods with a low-salt content do not sell well.
Sweets and fats are also staples of the consumer food market. Consumers in the United States spend approximately 21.5% of their total food expenditures on oils, fats, sugar, confectioneries, and soft drinks; while not as high in other countries, expenditures on these food items still remain a significant portion of total food expenditures (Euromonitor International, n.d.). One study of television food advertisements directed to children found that 63% were for foods with high concentrations of fat and/or sugar (Wilson, Quigley, & Mansoor, 1999). Coca-Cola, first mixed in 1866, is a historical and global example of the success of a product that has co-opted the human preference for sweets. It is one of the most (arguably the most) recognized brands in the world. In 1998 Coca-Cola ranked 8th on the list of global advertisement spenders and was first in product global presence, being present in 69 countries (Kloss, 2001). People’s preferences for fat, sweets, and salt also contributed to the growth of fast food restaurants. If people did not like the taste of greasy hamburgers and salty french fries, these restaurants would have quickly gone out of business (see, e.g., Kramer, 1997).

The abundance of junk food is taking a toll on human health. In 1999, 60% of Americans adults were classified as overweight and 27% as obese. Twenty five percent of American children are overweight and 10% are obese (Economist, 2002). While sedentary lifestyles and lack of exercise contribute, the excessive consumption of fats and sweets plays a significant role. One strategy to combat the problem is to reduce the amount of fat in food or to develop fat substitutes. However, given our evolved preferences for fats and sweets, such strategies have been ineffective. Consumers do not like the taste of low fat foods (Hamilton, Knox, Hill, & Parr, 2000); unfortunately,
finding a fat substitute that tastes like the real thing has proven illusive (Taylor & Linforth, 1998).

**Preferences for savanna-like landscapes.** Psychological mechanisms for landscape preferences evolved because landscapes with certain features were more conducive to survival and reproduction than others. This why most people still regard certain types of landscapes and landscape features as more beautiful, and hence, attractive than others (Kaplan, 1992; Orians & Heerwagen, 1992). This is consistent with Thornhill’s definition of beauty: “beauty is the moving experience associated with information processing by aesthetic judgment adaptations when they perceive information of evolutionarily historical promise of high reproductive success” (1998, p. 557). Most people instinctively find pictures of clear, flowing water more beautiful than a pool of stagnant water, grassy landscapes with scattered trees and lakes more attractive than arid, treeless landscapes, and mountains or hills in the distance more attractive than flat terrain. Clear, flowing water usually has fewer potentially harmful bacteria than stagnant water; savanna-like landscapes have higher concentrations of resources for land-dwelling, omnivorous primates (Orians & Heerwagen, 1992); mountains and hills convey a sense of mystery and a desire to learn more about a landscape (Kaplan, 1992).

Empirical studies have found that people have strong preferences for such ancestral cues as “water sources, oasis, flowers, ripe fruits, savanna (open forests that give easy visual access), growth and leaf patterns of healthy savanna trees, closed forest canopy (shelter), caves (with easy access to outside landscape), and mountains” (Thornhill, 1998, p. 562).

These evolved preferences are commonly used in advertising. Marketers use attractive landscapes to evoke positive emotional associations. Landscape features have
often been used, in our culture and in others, to distinguish among brands and to impart desirable associations (Gould & Minowa, 1994; Goodrum & Dalrymple, 1990). Mountains, mystery, and adventure are de rigueur in marketing campaigns for sport utility vehicles (Messaris, 1997). Landscapes appealing to evolved preferences for verdant savanna-like landscapes, mountains, water, and flowers are also prominent in marketing resorts (e.g., Steinauer, 2002; Successful Meetings, 2001). To anyone who has spent any time in a hotel or resort, it is obvious that landscape features influence the price of a room. Rooms with a view of mountains or lakes are inevitably more expensive than rooms with a view of a parking lot.

Interestingly, even products that can be harmful are given a healthy patina through clever associations with beautiful landscapes. Advertisement for Kool cigarettes superimpose a pack of Kools over a sparkling river surrounded by lush greens and wooded patches (Leiss, Kline, & Jhally, 1986, p. 196). Alcoholic beverages, such as Coors Beer, are frequently marketed in a similar manner, with the product superimposed over a mountain stream running through a beautiful landscape.

Adaptive Differences Between Males and Females

Men and women differ in some evolved mechanisms. This is due to different adaptive problems faced by the sexes and to differences in traits favored by sexual selection (Buss, 1994; Miller, 2000). Because of the physiological and psychological demands associated with gestation, birth, lactation, and attachment, human females provide more parental investment in offspring than males (Andersson, 1994). Parental investment is the effort and resources devoted to an offspring that improves its chances of survival and that also limit the parent’s ability to invest in other offspring (Trivers, 1972).
The welfare of children is more dependent on the mother staying alive than the father (Högberg & Broström, 1985). Therefore, natural selection favored women who were less prone to risky and aggressive behavior. Although contextual factors (e.g., threats to offspring) can trigger aggressive behavior in women, women are, on average, significantly less aggressive, more fearful, and less prone to take risks than men (A. Campbell, 1999). Women’s greater parental investment also helps to explain why women are more nurturing and have a greater interest in children than do men (Geary, 1998).

Women are also the primary arbiters in mating relationships (Geary, 1998). Their greater parental investment motivates women to be more selective in their choice of short-term and long-term mates. It is in females’ genetic interests to mate selectively with “high quality” males. Women attend to a larger number of attributes of potential mates and are more discriminating in their choice of mating partners. Females favor males with traits associated with resource acquisition, health, good genes, and kindness. They prefer males who exhibit signs of high social status and wealth (expensive ornamentation, age) or who have the ability to gain high social status (intelligence, social dominance, competitiveness, height), are in good health and have good genes (height, firm musculature, athleticism), and display a temperament compatible with being a good husband and father (kindness; Ellis, 1992). Recent studies provide evidence of the reproductive consequences of some of these preferences. Tall males father more children than shorter males (Pawlowski, Dunbar, & Lipowicz, 2000); women are more attracted to men with masculine facial features during that part of their monthly cycle when the probability of conception is highest (Penton-Voak, & others, 1999).
It is in males’ genetic interests to mate with a wide variety of healthy, fertile females. Males pay attention to fewer attributes of potential mates than women do, attending to primarily physical cues related to health and fertility. These include youthful appearance, a waist to hip ratio of about .70 (fertility and health), smooth skin (youth, absence of parasites), lustrous hair (youth), full lips (high estrogen level), and a bouncy gait (youth, energy). When seeking out long-term mates, males are also attentive to traits that signal that a woman would be a good mother and sexually faithful (Buss, 1994).

Members of each sex engage in intrasexual competition to compete for access to desirable members of the opposite sex. In most primate species, including humans, male-male competition is more intensive than female-female competition. In male-male competition, males compete with one another for status, resources, and social dominance. They do this ultimately to gain access to sexually receptive females (Geary, 1998). Female-female competition involves competition for high quality males for mating and marriage partners. Women typically compete with one another for resources by presenting themselves in ways that are viewed as attractive to men, ways that “mirror the attributes associated with male choice of mating partners, such as physical attractiveness” (Geary, 1998, p. 137).

Marketing and Adaptive Differences between Males and Females

Personal advertisements, where people advertise themselves in periodicals and on the Internet in hopes of attracting a short- or long-term mate, are a particularly revealing arena to examine the interplay of evolved sex differences and marketing. Males are more likely to advertise their professional and financial status, while women typically advertise attributes related to physical beauty (Greenlees & McGrew, 1984); older women are less
demanding in what they require in a mate, whereas older men are more demanding  
(Campos, Otta, & Sequeira, 2002). Height, education, resources, and age of male  
advertisers are positively related to the number of responses from females. Age, weight,  
and education are negatively related to female hit rates (Pawlowski & Koziel, 2002).  

_Evolved preferences._ Much of traditional marketing mirrors evolved sex  
differences. Product development and advertising reflect the constellation of evolved sex  
differences grouped under the categories of _communal_ (concern for others, interpersonal  
harmony) and _agentic_ (task emphasis, competition) orientations. Women are more  
communal and men more agentic (Archer, 1996). Marketing practices reflect females’  
greater interest in children and safety. Advertisements for child-care products are much  
more evident in publications and programming directed at women (Reda, 1994;  
Shermach, 1994). Products related to personal and child safety are also directed more  
towards females (Garfield, 1999). One reason that women became a major market for  
sport utility vehicles is their ostensible safety features, such as larger size and all-wheel  
drive (Scotti, 1998). The sales of romance novels and wedding products reflect women’s  
preferences for romantic involvement and committed relationships over short-term sexual  
liaisons. Women are the primary consumers of romance novels, which account for  
almost 50% of all paperback books sold (_Discount Store News_, 1996). Harlequin, a  
major publisher of romance novels, sold 205 million books in 1992 in 108 countries and  
26 languages (_Economist_, 1993). Magazines, services, and products related to weddings  
are almost exclusively aimed at young women (Fine, 2000). There are plenty of  
magazines for brides; we are not aware of any for grooms.
The development and marketing of toys is largely gender specific. Girls’ toys typically reflect females’ greater interest in beauty, infants, and nurturing, while boys’ toys reflect a greater preference for competition, rough and tumble play, and mechanical objects (Fitzgerald, 1993). Gender specificity with children’s toys has paid off handsomely. Mattel’s Barbie doll accounted for $1 billion of Mattel’s $1.6 billion in total sales in 1991 (Brandweek, 1993). Mattel’s “He-Man: Masters of the Universe,” an aggressive, muscle-man action toy, was one of the most successful boys’ toys ever introduced (Mandese, 1990). Gender-based toy preferences appear to be due more to innate propensities than to socialization. Alexander and Hines (2002) found that young male and female vervet monkeys exhibited gender-typical preferences for toys. Male monkeys spent more time than females playing with a toy car and females spent more time playing with a doll.

Women also tend to form closer ties with same-sex friends than men; female groups are less hierarchical than male groups (Colarelli, Alampay, & Canali, 2002b; Fisher, 1999). Marketers have taken advantage of intensive, flat female networks by engaging women to directly sell to their friends. Tupperware parties are a classic example. Approximately 72% of American women have attended a Tupperware party; with 34% of American women attending over six. Tupperware parties have also been successful across cultures. Tupperware has sales consultants in over 100 countries, with 80% of sales occurring overseas (Verburg, 2002). The economic success of women’s micro-industries financed by the Grameen Bank in Bangladesh is an example of a consumer services based on the nature of female relationships (Yunus, 1999). Ninety-five percent of the Grameen Bank’s borrowers are women (Wahid, 1999). The Grameen
Bank originated in 1976 (and was chartered as a bank in 1983) in Bangladesh to provide credit without requiring collateral to poor, primarily female, villagers. New borrowers are required to join a small group of established borrowers. Obtaining a loan is based on the approval of peers in the group. Default by any individual in the group results in all group members having their credit line suspended or drastically reduced. The Grameen Bank is one of the most successful Third World economic development programs to date. By 1998, it established 1,118 branches, providing service to 38,766 villages. It has 2.3 million borrowers, $2.5 billion in cumulative loans, $185 million in savings, and a 98% loan collection rate.

One of the strongest evolved preferences among males is the desire for young, fertile females. The adage “sex sells” is a truism in marketing. Beautiful women have been used in ads to sell everything from cars to scientific equipment. Using females as sex objects in advertisements is routine in many countries (Caudle, 1994). It is also an example of classical conditioning in advertising (cf. Gorn, 1982). Beautiful women are prominently placed in print ads to attract readers’ attention and are, for heterosexual men, an unconditioned stimulus. They stimulate a pleasant, sexually arousing response in sexually mature males. Marketers take advantage of this evolved mechanism by pairing a beautiful woman (unconditioned stimulus) with a product (conditioned stimulus). The goal is to evoke the same reaction in males who view the product (conditioned response) as they exhibit when viewing an attractive female (unconditioned response). That ads using attractive women routinely appear in even highbrow newspapers attests to the power of this mechanism. Beautiful females are also a feature of certain products that appeal to males, particularly literature, visual art, and pornography. Erotica has existed
throughout history, is found across cultures, and has been a minor staple of literature and the visual arts (Loth, 1961). The appeal of pornography to males has become particularly evident with advent of the Internet. The audience of Internet porn sites is approximately 84% male (Weiss, 2001). There are approximately 50,000 porn sites in countries throughout the world (Gruenwedel, 2000). In 1999, web porn accounted for 70% of the online paid content market (Kavanagh, 1999). Porn is also a mainstay of the pay-per-view cable TV market, accounting for 69 percent of sales (Gruenwedel, 2000).

**Same-sex Competition.** People engage in same-sex (intrasexual) competition to make themselves more attractive to the opposite sex than their competitors. A central arena of female-female competition is physical attractiveness. This helps to account for the appeal of cosmetics to women and for the success of the cosmetics industry: the function of cosmetics is to enhance physical beauty. Women are the primary consumers of cosmetics; men account for only 7% of the market share ([www.cosmeticmarket.com](http://www.cosmeticmarket.com), 1996). Cosmetic advertisements date back (at least in America) to the 1750s (Goodrum & Dalrymple, 1990). Newspaper ads portrayed attractive women using a variety of cosmetics, such as soaps, make-up, and hair products. Although advertisements have changed to reflect the times, their core themes have remained constant: slowing the aging process, beautifying one’s hair, and enhancing a body part. Many cosmetics ads portray attractive women as young and fertile. An ad for Palmolive soap, appearing in 1928, is illustrative. It depicts a young female holding a bouquet of flowers and reads: “He remembered that schoolgirl complexion. Youth is charm, and youth lost is charm lost, as every woman instinctively realizes” (Goodrum & Dalrymple, 1990, p. 130).
Much of male-male competition involves competition over status, resources, and reputation (Buss, 1994, 1999). Not surprisingly, marketers have used this to their advantage. Young males in the US gain status and reputation primarily through athletic prowess (Coleman, 1965). Sports magazines, which illustrate male-male competition and promise improvement of readers’ competitive abilities, have huge circulations (www.magazine.org, 2002). Nearly all universities in the US spend proportionately more on male than female sporting programs (www.chronicle.com, 2002). For many universities, money spent on male teams more than doubles that which is spent on female sporting teams. As males age, male-male competition centers more on work and money than athletics. Not surprisingly, the readership of the major management and finance periodicals – *Fortune, Forbes, and Business Week* – is primarily male (Corazza, 1984).

Two of the best-selling men’s magazines, *Playboy* and *Sports Illustrated*, appeal to men’s interest in beautiful young women and male-male competition. *Sports Illustrated* and *Playboy* were ranked 16th and 17th, respectively, in average annual circulation in 2001 (www.magazine.org, 2002). The two best-selling women’s magazines (ranked sixth and seventh) were *Better Homes and Gardens* and *Family Circle*, which feature articles on home, children, food, and relationships. *Men’s Health*, a hybrid men’s magazine that features articles on relationships, food, as well as male-male competition ranked only 44th. Products that assume no or little sex differences in sexuality and competitive orientation often fail in the marketplace. The magazine, *Sports Illustrated Women*, a female-oriented version of *Sports Illustrated* featuring articles on female athletic competition and adventure sports, printed its last issue in December 2002, after only two years on the market (Colford, 2002). *Playgirl*, a female version of
Playboy, featuring sexually explicit pictures of men, had to revamp its content and format to resemble more traditional women’s magazines to stay viable (Calvacca, 1998).

**Variation and Selection**

Evolution by natural selection occurs through small incremental changes, and variation is a critical element in this process (Colarelli, 2003; Dawkins, 1986). Small variations – mutations, imperfect imitations, mistakes, and new ideas – are the stuff from which new biological and cultural adaptations evolve. Of the many variations a system is exposed to, only a few survive, at least for a while. Sufficient variation helps a system cope with uncertain futures by improving the probability that some variations will enable the system to adapt to unpredictable changes in the environment.

Systems typically develop structures that maintain *requisite* – neither too much nor too little – variation (Colarelli, 2000; Williams, 1996). Sexual reproduction and incest avoidance are classic examples of biological and psychological mechanisms that perpetuate genetic variation; assortative mating (mating with partners who share similar characteristics) helps to keep variation in check. Imperfect imitation, travel, and immigration are examples of social processes that perpetuate cultural variation; habit, custom, and norms are social processes that limit cultural variation.

A good deal of variation, however, is genetic and cultural noise (Tooby & Cosmides, 1990). Variation tends to manifest itself more frequently on relatively unimportant traits, such as eye or hair color. Most of these surface variations have little relevance to survival and adaptation. On the other hand, there is less variation in traits that are adaptive—almost all humans have two eyes and opposable thumbs. Adaptations vary less because, over the long term, they are important to survival and reproduction.
Variation and Marketing

Evolutionary conceptions of variation are relevant to marketing in at least two ways: (1) change and adaptation and (2) appealing to individuals. Variation in consumer products and advertising helps to insure that useful products and advertisements will be available to meet changing trends in consumer demand. Variation helps to meet the needs of individual consumers. Although humans share many adaptations, they also differ (Medawar, 1981). For example, even though most people enjoy eating sweets, they vary in their preferences for particular flavors. Some people prefer grape jam; others prefer strawberry.

Continual variation is the lifeblood of the popular cultural marketplace. Fads and fashions come and go with amazing regularity in popular culture. New talent is the lifeblood of the rock and roll industry. Most new bands never make it, but a few do (Hire, 1986). Variation is a better strategy in the music industry than betting that one particular band will take off. Introducing variation and establishing mechanisms for nurturing variation are also important in large, mainstream corporations. Variation-creating strategies include hiring out-of-the-box thinkers, providing architectural and social structures that facilitate interaction among different groups of employees, and allowing employees freedom to develop ideas and products (Leifer, McDermott, Colarelli-O’Connor, Peters, Rice, & Veryzer, 2000). Variation in advertising also helps to keep old products current. Classic Coca-Cola varied little since its conception; however, the marketing of Coca-Cola has been characterized by continual variation in advertising strategies (Goodrum & Dalrymple, 1990).
Variation is useful in market research. A fundamental notion in evolutionary theory is that predictions about the future are problematic. The large number of variables, interactions, and environmental contingencies inherent in biological and social systems preclude precise prediction (Colarelli, 2003). Thus, traditional marketing research has a spotty record of predicting what consumers will buy (Zangwill, 1992, 1993). Some marketers, however, use research strategies that are driven by variation, a type of guided evolution. Rather than trying to predict what consumers want through extensive consumer surveys and focus groups, they introduce variations of a product into the market and wait to see what consumers choose. Based on the feedback from sales, firms learn what consumers really want, and then they revise their products accordingly. Variations are selected by consequences rather than by predictions. Zangwill (1992) describes how some of the most successful consumer product companies use this approach. Sony, Sanyo, Seiko, and Citizen often develop a platform of a product from which several variations can be easily produced. They then put several (sometimes hundreds) of variations on the market and see which ones sell best. Sony introduced over 160 models of its Walkman into the market to discover which ones consumers preferred.

Many marketers are aware of the importance of understanding individual consumer needs (Lee & Johnson, 1999), and recent technological innovations in manufacturing and communications have allowed mass marketing to achieve a more personalized feel. Major companies that could not meet individual consumer needs can now do so. At a number of companies, building customization of and variation in products is not only a marketing strategy but also an organizational philosophy. Dell Computer’s mission statement states that Dell is committed to “meeting customer
expectations of flexible customization capability” (www.dell.com, 2002). General Motors (GM) also integrates marketing and manufacturing to allow customers to personalize products. In fact, GM was a pioneer in personalizing products on a mass scale. It was one of the first automobile manufacturers to give customers a choice in the color and style of automobiles (Chandler, 1964). GM’s use of variation and selection by consequences was a marked contrast to Ford’s strategy of standardization. GM’s responsiveness to customer preferences was one reason why GM surpassed Ford in market share. Today, GM has a feature on its web site allowing consumers to “build your own vehicle” from the ground up (www.gmc.com, 2002). The consumer can choose from hundreds of variations, including, color, seat cover type, equipment accessories, and engine size.

Conclusions

The applied social sciences exist in two worlds. One is applied research and the other is practice. Sometimes these two worlds are in agreement about social interventions; often they are not. The applied research world frequently criticizes the world of practice—for ignoring its recommendations, for failing to use the latest research findings, and for relying on common sense and rules of thumb. The idea that a practice proved its mettle by withstanding the test of time is usually an anathema to applied researchers. Yet, it often turns out that the world of practice was right and the world of applied research was wrong (Lindblom, & Cohen, 1979). For example, industrial psychologists criticized human resource practitioners for using the employment interview, arguing that their research showed that the employment interview was ineffective in predicting job performance. After a half a century of criticism, studies now
suggest that the interview is actually a good predictor of job performance (McDaniel, Whetzel, Schmidt, & Mauer, 1994) and that it serves other useful functions (Adams, Elacqua, & Colarelli, 1994; Colarelli 1996). It is possible that marketing practitioners have a more veridical conception of human nature than marketing researchers. Practitioners appear to use an intuitive evolutionary perspective in developing marketing practices, and advertisements and consumer products that tap into evolved psychological mechanisms seem to have a robust appeal to consumers.

An implication of the evolutionary perspective for marketing research is *reverse engineering* of successful practices. Marketers may profit by studying products and ad campaigns that have been successful over the years and across cultures and by using them as templates. A second implication is explicitly incorporating evolved psychological mechanisms into product development and marketing. Some people may want little boys to be less competitive or they may want people to eat less fat and fewer sweets. But who is going to have more success in the marketplace, firms that appeal to young males’ propensity to behave competitively with one another or those that appeal to males as nurturers, firms sell sweet snacks with a high fat content or those that sell low fat and non-sweetened snacks? However, in a complex world in which individuals and cultures are in some ways unique, making precise predictions about the effects of interventions is a risky business. Therefore, a third implication of the evolutionary perspective for marketing is to embrace variation and uncertainty, working with them rather than trying to engineer them out. This includes individualizing products and advertising, introducing multiple prototypes, and emphasizing quick-response production.
Successful marketing appeals to human nature, which is a mixed bag. People can be compassionate, generous, and coöperative; humans are frequently altruistic, moral, and restrained. And marketers develop products and provide information about products that appeal to the noble side of our nature, for example, college savings plans, environmentally friendly products, and services to care for the poor and elderly. Yet, people can also behave aggressively; they can be selfish and vindictive; people’s desires can spin out of control into gluttony and hedonism; they are not above deceiving others when it is to their advantage. Marketers are often criticized for selling products that appeal to people’s baser side, such as pornography, junk food, status symbols, and products that harm the environment. A recurring problem in, and criticism of, marketing is deception in advertising. While difficult to condone, deception will probably be a staple of advertising because, as Dawkins (1976/1989) reminds us, deceit is an inherent attribute of animal (including human) communication.

Given the realities of human nature and the criteria by which the success of marketing efforts are judged (i.e., sales), appeals to our baser side will remain a staple of marketing practices. Unfortunately, this may become increasingly problematic because of the mismatch between our evolved nature and the nature of modern society. It is now relatively easy to design and sell products that hijack our evolved mechanisms and induce people to over-consume and consume harmful products. A better understanding of human nature is certainly a necessary, but not sufficient, condition for mitigating harmful excesses. It is also necessary that markets remain free and competitive. The conflict of competing interests and ideas is perhaps the most effective restraint on unbridled excess.
References


http://www.siop.org/tip/backissues/TipApril00/7Diclemente.htm


*Economist.* (1993, June 5). Her passion embraced a new adventure, 70.


Euromonitor International. *World marketing and data statistics (for Central Michigan University).* Retrieved October 9, 2002, from World Wide Web:


*Successful Meetings*. (2001, May 17). Away from the madding crowd, 10-17


Table 1

*Evolved Psychological Mechanisms Identified in Evolutionary Psychology*

<table>
<thead>
<tr>
<th>Psychological Mechanism</th>
<th>Functions</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altruism towards kin</td>
<td>Increase inclusive fitness</td>
<td>Hamilton (1964)</td>
</tr>
<tr>
<td>Prestige seeking and imitating high-prestige individuals</td>
<td>Resource acquisition and efficiently identifying useful skills, values, and beliefs</td>
<td>Barkow (1989), Henrich and Gil-White, 2001</td>
</tr>
<tr>
<td>Preference for risk to avoid loss</td>
<td>Help ensure sufficient resources in uncertain environments</td>
<td>Kahneman and Tversky, (1981); Moore (1996)</td>
</tr>
<tr>
<td>Preference for foods rich in fats and sugar</td>
<td>Increase caloric intake</td>
<td>Rozin (1976)</td>
</tr>
<tr>
<td>Fear of snakes</td>
<td>Avoid poison</td>
<td>Marks (1987)</td>
</tr>
<tr>
<td>Landscape preferences for savanna-like environments</td>
<td>Motivate individuals to select habitats that provide resources and offer protection</td>
<td>Kaplan (1992); Orians and Heerwagen (1992)</td>
</tr>
<tr>
<td>Female mate preference for Economic resources</td>
<td>Provisioning for children</td>
<td>Buss (1989)</td>
</tr>
<tr>
<td>Male mate preferences for youth, attractiveness, and waist-to-hip ratio</td>
<td>Select mates of high fertility</td>
<td>Buss (1989); Singh (1993)</td>
</tr>
<tr>
<td>Superior female spatial-location Memory</td>
<td>Increase success at foraging/Gathering</td>
<td>Silverman and Eals (1992)</td>
</tr>
<tr>
<td>Male sexual jealousy</td>
<td>Increase paternity certainty</td>
<td>Symons (1979)</td>
</tr>
<tr>
<td>Natural language</td>
<td>Communication/manipulation</td>
<td>Pinker and Bloom (1992)</td>
</tr>
<tr>
<td>Detection of cheaters</td>
<td>Prevent being exploited in social contracts</td>
<td>Cosmides (1989)</td>
</tr>
<tr>
<td>Male desire for sexual variety</td>
<td>Motivate access to more sexual partners</td>
<td>Symons (1979)</td>
</tr>
</tbody>
</table>

Adapted from Buss (1995)
Author Note

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