5 Evolution and Consumer Behavior

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Imagine if Charles Darwin walked into a modern shopping mall. How would he react? From the dazzling sights and sounds to the dizzying array of smells and behaviors, Darwin would likely find many of the things he sees quite puzzling. In fact, Darwin was similarly puzzled by many of the strange characteristics and behaviors of the animals he encountered in his travels around the world. Decades of detective work and such observations led Darwin to formulate the theory of natural selection (Darwin, 1859). Darwin's theory became the unifying framework of the life sciences, helping understand the characteristics and behaviors of all living organisms, including humans. Today this interdisciplinary framework is the bridge between the social and the natural sciences, regularly incorporated into modern psychology, anthropology, and other behavioral sciences.

So how would Darwin seek to make sense of the behaviors in a twenty-first-century shopping mall? In the same way he sought to understand all living organisms – by starting with a simple question: What adaptive function might these behaviors serve?

This question is the starting point for a Darwinian detective – anyone seeking to understand modern behavior in an evolutionarily informed way. The purpose of this chapter is to elucidate what it means to take an evolutionary approach to consumer research. In so doing, we highlight the value of incorporating this approach in consumer research, discuss relevant theories and findings, and offer suggestions for easy ways to incorporate an evolutionary perspective into any area of study.

An Evolutionary Approach to Consumer Behavior

An evolutionary approach to studying behavior can be summarized in the following way:

- All human behavior includes an evolutionary explanation.
- Evolutionary explanations concern the adaptive function of behavior.

All Behaviors Include an Evolutionary Explanation

If you're a social scientist who hasn't been exposed to evolutionary biology, it might seem reasonable to assume that a few human behaviors might be

related to evolution, but that many others are probably unrelated to evolution. Unfortunately, this assumption is blatantly false. In reality, all behaviors *include* an evolutionary explanation. This is because any behavior has multiple explanations at different levels of analysis.

For a concrete example, consider the question, why do babies cry? One way to answer this question is that babies cry because they feel distress (e.g., pain, discomfort, hunger, or separation). Another way to answer this question is that babies cry because this behavior functions to elicit care from a caregiver. But it is also equally accurate to explain that babies cry because they are born with a specific crying mechanism. This mechanism follows a relatively fixed developmental trajectory in the first three months of life, but crying then becomes influenced by learning as the baby matures cognitively. And more broadly, babies cry because this is typical behavior for all primate infants and can be traced back to a common ancestor.

There are multiple ways to answer the question of why babies cry. All of the answers are correct, but each one provides a fundamentally different type of explanation for the behavior. This is because all behavior – from crying and coughing to conservation and conspicuous consumption – has multiple explanations. The most widely used method for categorizing explanations was developed by Nobel Prize–winning ethologist Niko Tinbergen (1963). Commonly referred to as "the four questions," Tinbergen grouped explanations into four categories, whereby each explanation is associated with a different type of question:

- **Proximate Mechanism:** What are the triggers (causes) of the behavior?
- **Development:** How does the behavior come about during one's lifetime?
- **Adaptive Function**: What adaptive problem(s) does the behavior ultimately function to solve?
- **Evolutionary History**: How did the behavior arise in the species?

The first two explanations concern processes that occur within the lifetime of the individual. The latter two explanations reside within the deeper realm of evolutionary biology. Table 5.1 provides a deeper overview of the four types of explanations.

When seeking to understand a given behavior, a researcher can begin by starting at any of the four types of explanations. Consumer researchers tend to focus primarily on the first type of explanation – the proximate mechanism. For example, the overwhelming majority of articles in the *Journal of Consumer Research* and the *Journal of Marketing Research* focus exclusively on the proximate mechanism as the sole explanation for behavior. Focusing on the proximate mechanism makes good sense and provides valuable insight into behavior, but to fully understand any behavior it is useful to consider it at more than merely one level of explanation.

Table 5.1 *Four Types of Explanations for Behavior*

Type of Explanation	Central Question and Potential Answers	Example: Why Do Babies Cry?
Proximate Mechanism (Causation) *How does it work?*	**What are the relatively immediate causes of a behavior?** Most behaviors have multiple proximate causes, including environmental cues, social cues, physical state, psychological state, hormones, pheromones, genes, neurological firing, etc.	Babies cry because of distress (e.g., pain, discomfort, hunger, or separation). These explain the proximate mechanism of the behavior because they pertain to the immediate triggers (causes) of the behavior.
Development (Ontogeny) *How does it come about?*	**How does a behavior come about during one's lifetime?** Possibilities include learning, specified developmental trajectory, imprinting, cognitive maturation, environmentally contingent expression of genes, etc.	Babies cry because infant crying follows a relatively fixed developmental trajectory in the first 3 months of life. It then becomes influenced by learning (e.g., when a child is able to form mental representations, crying can be induced by the mere threat of maternal separation).
Ultimate Function (Adaptation) *Why did it evolve?*	**What adaptive problem(s) does a behavior ultimately function to solve?** Some behaviors function to solve one adaptive problem, whereas others can solve multiple problems such as how to obtain food, avoid disease, decrease danger, make friends, attain status, attract mates, care for family, etc.	Babies cry because this behavior has reliably elicited care from a caregiver (e.g., food, holding). These are the ultimate functions of the behavior because they explain how the behavior has enhanced fitness throughout evolutionary history.
Evolutionary History (Phylogeny) *How did it evolve?*	**How did a behavior arise in the species?** Possibilities include that a behavior can be traced to a common ancestor, behavior evolved independently in multiple species, behavior is unique to humans, etc.	Babies cry because it is typical for babies in all primate species to cry. This suggests that multiple species share a similar crying mechanism with a common function that resulted from the same selection pressure.

The Adaptive Function of Behavior

An evolutionary psychological approach focuses on Tinbergen's third type of explanation – the adaptive function. This approach dates back to Darwin's (1859) theory of natural selection. 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 onto future generations. Characteristics

that enhanced reproductive fitness were passed on to future generations, whereas those that impeded it were not. Natural selection therefore maintains particular characteristics because they have (or once had) fitness benefits. The process of natural selection can result in three products:

- **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)

The principles of natural selection have long been applied to the study of human anatomy and physiology. However, there is now widespread recognition that these principles are powerful tools for understanding psychology and behavior in human and non-human animals (Alcock, 2001; Buss, 2005; Dunbar & Barrett, 2009; Barkow, Tooby, & Cosmides, 1992).

An evolutionary psychological perspective stresses that the human mind is a complex integrated assembly of psychological adaptations – a premise shared widely by evolutionary biologists in understanding animal behavior (Alcock, 2005; Barash, 1977; Wilson, 2000). *Psychological adaptations* are information-processing circuits that take in units of information (from both our external environments and our internal physiological systems) and transform that information into outputs designed to solve a particular adaptive problem (Barrett, 2012; Barrett & Kurzban, 2006; Cosmides, Barrett, & Tooby, 2010).

Psychological adaptations enhanced fitness by solving distinct adaptive problems. Just like physiological adaptations evolved to solve distinct problems in the service of survival and reproduction (think about the distinct problems solved by the heart, liver, lungs, etc.), psychological adaptations also evolved as solutions to qualitatively distinct adaptive problems.

Adaptive problems are many in number. To enhance fitness successfully, we need to obtain food and water. We must also obtain shelter, avoid disease, evade physical harm, make friends, attain status, find a mate, and care for family. Those humans who became our ancestors were the ones who were most successful at solving these problems and enhanced their fitness. Those who were less successful at solving these distinct adaptive problems failed to become anyone's ancestors.

Implication #1: Behavior Has Proximate *and* Ultimate Explanations

As highlighted in Tinbergen's four types of explanations, an evolutionary approach draws an important distinction between proximate reasons for behavior (the first type of explanation) and ultimate reasons for behavior (the third type of explanation). Consider a simple example. Let's say a colleague just bought a triple-chocolate fudge brownie, and you want to know the reason

behind her purchase. So you ask her: "Why did you buy that?" She might simply respond "I was hungry." If she were feeling more analytical, she might mention that she loves the taste of chocolate and couldn't resist the delectable scent of a warm baked brownie.

Your colleague's explanations all represent proximate reasons. Proximate reasons are important, but they don't address the deeper question of why brownies taste good to humans in the first place. Understanding these deeper reasons requires an ultimate explanation. Ultimate explanations focus not on the relatively immediate triggers of a behavior, but on its adaptive function. In the brownie case, humans have psychological mechanisms that respond positively to the sight, smell, and taste of foods rich in sugars and fats. These mechanisms exist because an attraction to such calorie-dense foods helped motivate our ancestors to obtain calories and survive in an environment that was often scarce in calories (Lieberman, 2003). So whereas the proximate reason your friend bought a brownie may be because she was hungry for a brownie, the ultimate reason is because a desire for sugary and fatty foods helped solve the critical evolutionary challenge of survival.

Sometimes the ultimate and proximate reason for a behavior might be closely connected. In the brownie case, the proximate reason (feeling hunger) is directly connected to the ultimate function of obtaining calories to survive. But most of the time, the connection between proximate and ultimate reasons will not be that clear. Consider, for example, why birds migrate each year.

The proximate reason birds migrate is because days get shorter; day length is the immediate cue that triggers the motivation to begin the bird's journey. But the ultimate reason for bird migration has nothing to do with day length. Instead, the ultimate reason birds migrate is because the locations of the best food sites and the best mating sites change with the seasons (Cocker & Mabey, 2005; Lincoln, 1999).

Like other animals, human beings do not need to know consciously the connections between the proximate triggers of their behavior and the ultimate reasons behind those behaviors. In fact, people are especially poor at recognizing the ultimate reasons for their actions (Barrett & Kurzban, 2006; Kenrick, Griskevicius, Neuberg, & Schaller, 2010a; Tooby & Cosmides, 2005). But an important insight is that behavior has both proximate and ultimate causes. People often have multiple reasons for a behavior, even if they are not always aware of the ultimate reasons for their choices. For example, a person can be consciously motivated to buy a sporty luxury car because its expensive leather interior and peppy acceleration makes him feel good (a proximate reason), and at the same time be subconsciously motivated to buy that luxury car because owning such a car can increase his desirability as a potential mate and thereby enhances his reproductive fitness (an ultimate reason) (Griskevicius et al., 2007; Sundie et al., 2011).

Implication #2: Evolution Is *Not* the Opposite of Learning

Just because behaviors are rooted in psychological adaptations does not mean that the environment plays no role in the behavior. Consider the fear of snakes.

A programmatic series of studies has shown that fear of snakes stems from a specific psychological adaptation (Mineka & Öhman, 2002; Nesse, 1990; Öhman & Mineka, 2003). Poisonous snakes have persistently posed a threat throughout evolutionary history, leading humans to possess adaptations designed to solve this adaptive problem.

However, this does not mean that people are born with a hardwired fear of snakes. Instead, humans and other primates have specialized learning mechanisms that prepare them to learn this particular association after they are born. Individuals rapidly condition to fear snake-like objects, often acquiring an intense fear in only one trial. For example, witnessing another person respond to a snake with fear just once can instil an intense phobia of snakes. The fear of snakes is extremely difficult to extinguish (it's easy to learn but difficult to unlearn), and it can be traced to specialized neural circuitry (Öhman & Mineka, 2001).

The important takeaway is that evolution is *not* the opposite of learning, socialization, or culture. An evolutionary approach dissolves false dichotomies such as "nature versus nurture," "innate versus learned," and "biological versus cultural." For instance, it does not make sense to ask whether fear of snakes or infant crying are "evolved" or "learned" or due to "nature" or "nurture." Most psychological adaptations require some sort of environmental input for their activation. Because all behavior is produced by the mind, and because the mind evolved via natural selection, all behavior is biologically influenced and has some evolutionary component.

In summary, all human behavior includes an evolutionary explanation. It does not make sense to ask whether a behavior is evolutionary or not. Asking such a question is the equivalent of pitting Tinbergen's four types of explanations against each other. All four types of explanations are complementary, and all four are needed to fully understand any behavior. An evolutionary psychological perspective focuses on Tinbergen's third type of explanation, asking about the adaptive function of behavior. It focuses on how a given behavioral or psychological tendency would have helped our ancestors solve some adaptive problem. Sometimes the answer is obvious, and people are consciously aware of how a given tendency helps solve an adaptive problem. But many times, the answer is not obvious because a given behavior can be concurrently driven by very different proximate reasons and ultimate reasons.

Core Theories and Findings

A common misconception about an evolutionary perspective is that it relies on one single theory. This is false. In the same way that consumer researchers don't base all predictions on a single theory called "social science theory," an evolutionary approach is not based on a single theory called "evolutionary theory." Instead, natural selection is a meta-theory that encompasses hundreds of different theories. Table 5.2 presents a small sampling of evolutionarily informed theories about various domains (for more details, see Saad, 2007). In

Table 5.2 *Sampling of Evolutionarily Informed Theories*

Theory	Domain	Sample Insight	Key References
Kin Selection	Interactions among family members	People help family because of shared genes	Hamilton (1963)
Trivers-Willard Hypothesis	How parents treat sons and daughters	Harsh conditions lead parents to favor daughters over sons	Trivers & Willard (1973)
Parent-Offspring Conflict	Interactions between parents and children	Children seek to extract more resources than parents are willing to give	Maestripieri (2002); Trivers (1974)
Reciprocal Altruism	Interactions among non-relatives	People help non-family to get rewards from them later	Hamilton (1964); Trivers (1971)
Indirect Reciprocity	Interactions among non-relatives	People help non-family to build a good reputation	Alexander (1987); Nowak & Sigmund (1998)
Sexual Selection	Gender differences	Men and women differ in competitiveness	Andersson (1994); Emlen & Oring (1977); Trivers (1972)
Parental Investment Theory	Gender differences	Women are choosier than men in sex partners	Trivers (1972)
Tend and Befriend	Gender differences	Men and women behave differently under stress	Taylor et al. (2000)
Paternity Uncertainty	Gender differences	Fathers are more likely to mistreat their children than mothers	Møller (2000); Westneat & Sherman (1993)
Sexual Strategies Theory	Mating and relationships	Men and women differ in what they seek in a mate	Buss & Schmitt (1993)
Strategic Pluralism	Mating and relationships	People can follow very different types of mating strategies	Gangestad & Simpson (2000)
Attachment Theory	Mating and relationships	Bond between mother and infant influences bonds with others later in life	Bowlby (1969); Simpson & Belsky (2008)
Costly Signaling Theory	Costly show-off behavior	People spend a lot of resources on signals to ensure that signals are honest	Miller (2000); Zahavi & Zahavi (1997)

Fundamental Motives	Context effects on behavior	People's evolutionary goals change depending on situation	Kenrick et al. (2010a); Griskevicius & Kenrick (2013)
Environmental Mismatch	Differences between ancestral and current environment	Some tendencies adaptive in ancestral environments are maladaptive today	Nesse & Williams (1994); Ornstein & Ehrlich (1989)
Life History Theory	Individual differences	Childhood environment calibrates people to differ in adaptive ways	Chisholm (1993); Kaplan & Gangestad (2005); Roff (2002); Stearns (1992)
Error Management Theory	Errors in judgment and decision making	People make errors in adaptive ways	Haselton & Buss (2000); Haselton & Nettle (2006)
Darwinian Gastronomy	Food preferences	People prefer spicier foods in hotter climates	Sherman & Billing (1999)
Adaptive Memory Theory	Memory	People have better memory for survival-related content	Nairne & Pandeirada (2008)
Ovulatory Shift Hypothesis	Hormones	Women's behavior changes during the ovulatory phase of the cycle	Gangestad & Thornhill (1998)

this section, we describe a few of these theories that are particularly relevant for consumer researchers.

Mismatch Theory

All living humans are descendants of ancestors who were nomadic hunter-gathers. Our ancestors lived in roving small bands of about fifty to one hundred individuals, many of whom were members of a few kin groups (Dunbar, 1993, 1998). For hundreds of thousands of years, natural selection shaped human psychology and behavior to solve adaptive problems specifically in this kind of environment. However, our modern-day environment is a bit different from the environment in which humans evolved.

Mismatch theory (Nesse & Williams, 1994; Ornstein & Ehrlich, 1989) highlights that brain evolution often takes many thousands of years, but our environment has changed much more rapidly. This means that people interact with their present-day world using brains that evolved to confront ancestral problems. Although our Stone Age brains are designed to produce adaptive behaviors in the ancestral environment, this does not mean that they will always produce adaptive behaviors today. For example, the evolved desire for sexual gratification can lead to modern behavior with no evolutionary benefits, such as watching pornography, which is sexually arousing but does little to help people's reproductive fitness.

Consider modern eating behavior. We evolved in a world where calories and nutrients were scarce. This produced a desire for foods high in sugar and fat. But whereas this desire was adaptive in our past environment, this proclivity can have downsides in the modern world of affordable caloric abundance. Instead of producing adaptive outcomes, it can instead lead to obesity and Type 2 diabetes (Hu et al., 2001; Meyer et al., 2000; Srinivasan et al., 2005).

Mismatch theory suggests that some of the behaviors we observe today are by-products of psychological mechanisms that were adaptive in the ancestral environment. For example, our ancestors did not have television. If they saw a person come into their living space every day, this person was likely a friend. In the modern world, however, people come daily into our living space via television and other media. Although we obviously "know" that such people are not real people who are physically present, at some level our brain continues to classify these people as "friends" (Barkow, 1989, 1992; De Backer et al., 2007; Kanazawa, 2002). In fact, we end up wanting to know gossip about these "friends," even though we are unlikely to ever meet them.

Mismatch theory provides a useful lens through which to look at modern behavior. For example, in the modern world, we are awash in numerically expressed statistical information. You may have spent enough years in math classes to cognitively understand that a 0.07 probability and a 7 percent likelihood mean the same thing, but many of us will still furrow our brows and squint our eyes when digesting a statement about a 0.07 probability. Probabilities and likelihood estimates are a common way to present statistical information, but

they are also an evolutionarily recent invention, arising in Europe in the mid-1600s. Because presenting information in the form of probabilities is evolutionarily novel, this format can lead to a lot of problems and take many years of explicit education to fully comprehend.

Instead of presenting information as conditional probabilities or likelihood estimates, research has demonstrated that people are much better at computing statistical information if it is presented as *natural frequencies,* which represent the way ancestral humans encoded information (Gigerenzer & Hoffrage, 1995; Hoffrage, Gigerenzer, Krauss, & Martignon, 2002; Hoffrage, Lindsey, Hertwig, & Gigerenzer, 2000). For instance, when our ancestor would try to determine whether it was wise to go hunting in red canyon, he could consider what happened the last twenty times people went hunting in red canyon. The person observes natural frequencies – five out of the last twenty hunts in the red canyon were successful. Our ancestors did not observe probabilities in their natural environment. As a consequence, our brains do not process probabilities ("0.25 probability of success") in the same way as natural frequencies ("five out of twenty were successful"). Years of formal math training have taught most of us that these two statistical statements mean the same thing, but one is intuitive and the other one is not. In fact, people show dramatic improvements when hard questions are asked in terms of natural frequencies rather than probabilities (Galesic, Gigerenzer, & Straubinger, 2009; Hoffrage & Gigerenzer, 1998).

In summary, it is useful to think about the kind of environment in which our ancestors evolved and for which our psychology is geared. As in the case of pornography and celebrity gossip, this ancestral psychology can sometimes be "hijacked" by modern contraptions.

Error Management Theory

Imagine that you are hiking in the woods and you notice a rustle under the leaves in front of you. You must decide whether this rustle is the result of the wind or whether there is a snake or other dangerous creature afoot. Making this decision can result in two types of errors: (1) deciding that the rustle is the result of wind when it is actually a snake (a *false negative*) and (2) deciding that the rustle is a snake when it is actually wind (a *false positive*).

Error management theory (EMT; Haselton & Buss, 2000; Haselton & Nettle, 2006) posits that these two errors posed asymmetric costs to fitness across evolutionary history. Assuming the rustle is a snake when it is actually wind (the false positive) can result in a moderate expenditure of energy to run or jump away. But assuming the rustle is wind when it is actually a poisonous snake (the false negative) can result in death. Because the potential cost of the false negative is much greater, EMT predicts that natural selection should have forged cognitive and behavioral biases that lead us to err in favor of the judgment that poses a lower potential cost to fitness.

Error management theory has led researchers to formulate predictions about several errors in judgment and behavior. For example, if an object is moving

toward you at 20 feet per second and the object is currently 120 feet away, how long will it take for the object to hit you? The accurate answer is about 6 seconds. It would certainly be inaccurate if people thought the answer is 4 seconds – this would be a clear demonstration of an error in judgment. Yet the mind is wired to intentionally make this error. When our eyes see an approaching object, our brains tell us that this object will hit us *sooner* than it actually will. In fact, merely hearing the sound of an approaching object (the swooshing of a diving bird through the air, the rustling of someone in the bushes) will result in the same error. The bias to sense that approaching sounds will arrive sooner than they really do is known as *auditory looming* (Hall & Moore, 2003; Neuhoff, 2001; Seifritz et al., 2002). One study found that this "error" was made by 100 percent of people.

Like many errors and biases that seem irrational on the surface, auditory looming turns out, on closer examination, to be pretty smart. Other animals, such as rhesus monkeys, have evolved to have the same bias (Ghazanfar, Neuhoff, & Logothetis, 2002; Maier, Neuhoff, Logothetis, & Ghazanfar, 2004). This intentional error functions as an advance warning system, providing individuals with a margin of safety when confronted with potentially dangerous approaching objects. If you spot a rhinoceros or hear an avalanche speeding your way, auditory looming will motivate you to jump out of the way sooner rather than wait until the last second. The evolutionary benefits of immediately getting out of the way of approaching dangers were so strong that natural selection endowed us – and other mammals – with brains that intentionally see and hear the world inaccurately.

Consumer researchers have identified myriad decision errors, biases, and distortions. But they have mostly provided a laundry list of blunders, without offering a theory for the underlying causes behind why people make these mistakes. Error management theory provides a theory of mistakes. This adaptive theory of mistakes not only helps us appreciate the hidden wisdom of our otherwise senseless decisions, it also allows us to predict in advance what particular mistakes people will make and when. For example, recent research has used this approach to understand the overconfidence bias (Forbes, 2005; Johnson & Fowler, 2011; Scott, Stumpp, & Xu, 2003). The tendency to be overly confident might produce errors in judgment, but it turns out that this mistake produces evolutionary benefits by helping solve the adaptive problem of status and resource acquisition.

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 (Ackerman & Kenrick, 2008; Griskevicius & Kenrick, 2013; Kenrick et al., 2010a). 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.

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. A fundamental motive can be activated or primed by external or internal cues indicating threats or opportunities related to a specific evolutionary challenge (Kenrick et al., 2010a). For example, a person can activate the mate acquisition system by interacting with a desirable member of the opposite sex, or by 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. The system can also be activated when a person is confronted with a decision that concerns potential mates, as opposed to a decision that pertains to family, status, disease, affiliation, or danger.

When a fundamental motivational system has been activated, it produces a specific set of consequences for attention, memory, cognition, and preferences (Kenrick et al., 2010b; Neuberg, Kenrick, & Schaller, 2011). This coordinated cascade of responses functions to solve the ultimate problem associated with the currently active system. For example, 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, as in the case of ovulating women.

An important implication of the fundamental motives framework is that a person's preferences can change quite dramatically depending on which motivational system is currently active. This is because what constitutes adaptive behavior to further one ultimate need may be very different from – and sometimes even completely opposing to – what is adaptive to further another. For example, activating the self-protection system leads people to conform and follow the masses (Griskevicius et al., 2006). 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 (Griskevicius et al., 2009). Like wildebeests in the presence of a leopard, cues of physical threat motivate people to be part of a larger group.

In 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 (Griskevicius et al., 2009). Like an animal on the prowl looking to put on a display for a mate, cues of the opposite sex motivate people to stand out. The 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.

Just as fundamental motives can alter preferences, they can also alter decision-making processes – how one goes about maximizing his or her preferences. This has important ramifications for understanding how our decision

biases and errors wax and wane. Consider loss aversion, the tendency for people to weigh losses more heavily than equivalent gains (Kahneman & Tversky, 1979). Whereas this tendency is traditionally viewed as irrational, an evolutionary perspective suggests that loss aversion may be an adaptive bias that helped humans solve survival-related ancestral challenges. Consistent with this idea, activating the self-protection system makes people particularly loss averse (Li, Kenrick, Griskevicius, & Neuberg, 2012). When motivated to protect themselves from danger, people are especially concerned about losses. In contrast, activating the mate-acquisition system can lead loss aversion to vanish (Li et al., 2012). 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.

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.

Ovulatory Shift Hypothesis

Imagine the next twenty-eight days. For each of these twenty-eight days, how often do you think the desire to have sex will cross your mind? If you are a man, you might think about sex roughly equally across each of the twenty-eight days. If you are a woman, however, you might think about sex a little during days one through seven, a lot on days eight through fourteen, and very little on days fifteen through twenty-eight. Why would women's pattern of sexual thoughts and motivations look different from men's?

To answer this question, assume that the twenty-eight days are not random but map onto the length of a woman's ovulatory cycle. Most women experience an ovulatory cycle that spans twenty-eight days. And, unlike men, women's sexual behavior can result in pregnancy only near ovulation (days eight through fourteen 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 (Jones, 1997; Lipson & Ellison, 1996). Because over evolutionary history women could only reproduce when they ovulate, women's motivations and behavior evolved to shift adaptively specifically at this time. This notion is known as the ovulatory shift hypothesis (Gangestad & Thornhill, 1998; Gangestad, Thornhill, & Garver, 2002; Thornhill & Gangestad, 2008).

The ovulatory shift hypothesis posits that women should experience a shift in mating-related motivation and behavior near ovulation (Gangestad & Thornhill, 1998; Gangestad, Thornhill, & Garver-Apgar, 2005). Supporting this notion, research has since found that women experience an increase in sexual desire near ovulation (Bullivant et al., 2004; Gangestad, Thornhill, & Garver, 2002). For example, ovulation increases women's sexual attraction toward men who possess indicators of genetic fitness such as facial symmetry and attractiveness, masculinity, and social dominance (Cantú et al., 2013; Durante et al., 2012; Gangestad et al., 2004; Gangestad, Garver-Apgar, Simpson, & Cousins,

2007; Gangestad & Thornhill, 1998; Gangestad, Thornhill, & Garver-Apgar, 2005; Penton-Voak et al., 1999).

Research also shows that ovulation has a large effect on women's desire to dress in sexier outfits (Durante et al., 2011). 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 more revealing near ovulation – when estrogen levels are high (Durante, Li, & Haselton, 2008; Durante et al. 2011; Saad & Stenstrom, 2012). In fact, the ovulatory shift doesn't just help women optimize the choice of a sexual partner, it also helps them outcompete other women for access to the best men available. For example, 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 (Durante et al., 2011) – that is, when there is lots of competition for mates.

Research in non-human primates shows that ovulation has a direct effect on female competitive behaviors. For example, female rhesus monkeys become more aggressive and competitive during the ovulatory phase (Walker, Wilson, & Gordon 1983; Wallen, 2000). And indeed, ovulation in women influences their competitive tendencies (Durante, Griskevicius, Cantú, & Simpson, 2014). For example, in one study, ovulating and non-ovulating women made product choices that could either maximize absolute gains or maximize gains relative to other women (Durante et al., 2014). 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 $5,000 diamond ring in lieu of a $7,000 diamond ring) as long as they had better products than other women. Also, 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 (Durante & Li, 2009; Mazur & Booth, 1998). In addition to hormones regulating fertility, there are various other hormones that influence people's behavior in other domains (Nelson, 2005). For example, cortisol drives our responses to stressful situations (Dickerson & Kemeny, 2004), and oxytocin and vasopressin drive our desire to bond with family and friends (Young & Insel, 2002). Each of these hormones is likely to influence consumer behavior in important ways. Understanding how hormones influence behavior provides a unique window into the psychological underpinnings of consumer behavior.

Incorporating an Evolutionary Perspective into Research

How can you incorporate an evolutionary perspective into your research? In the subsections that follow, we discuss three ways that consumer researchers can incorporate an evolutionary perspective into their research.

Read beyond Your Discipline

Taking an evolutionary perspective means thinking a little differently about behavior than is typically thought about in consumer research. If you read only journals in marketing and consumer behavior, you are unlikely to encounter the plethora of evolutionarily informed theory and research relevant to your research area. One way to access this knowledge is by venturing off the beaten path and reading beyond the *Journal of Consumer Research* (*JCR*).

Imagine you're interested in food and eating behavior, and you're looking for novel research questions in this area. Consider searching for previous work on food and evolution. For example, type in the term "evolutionary psychology" next to whatever area you're studying. If you search for research in the domain of food and eating behavior, you will discover a theory called Darwinian gastronomy (Sherman & Billing, 1999). This theory helps explain why humans eat spices. Spices such as salt, garlic, onions, and chili peppers help kill poisonous bacteria and fungi that can contaminate food. Spices thus helped solve the adaptive challenge of disease avoidance, whereby developing a taste for spicy food enhanced fitness across evolutionary time, specifically in places where pathogens were a larger threat, such as warmer, tropical climates where bacteria are more diverse, plentiful, and fast growing. This theory helps explain why spicy meals tend to be found in warmer climates (e.g., Mexico, India, Thailand, the southern United States), while bland meals tend to be found in colder climates (e.g., Norway, England, Germany, the northern United States).

Now that you know more about the function of spicy foods, use these insights to derive hypotheses about the conditions under which people might have an increased desire for spices. If spices function to protect us from food-borne pathogens, one possibility is that environmental cues to pathogens might spur a desire for spicier food. For example, hearing a nearby person coughing and sneezing while ordering lunch might lead people to choose spicier food. By doing a little reading and considering the adaptive function of spicy food, you have just derived a novel and testable hypothesis.

Note that if your study were to find support for the hypothesis, it would not "prove" evolution. Likewise, if your study did not find support for the hypothesis, it would not "disprove" evolution. Instead, you have simply used an evolution-informed theory to derive a novel hypothesis – a hypothesis that you might not have thought of if you didn't venture off the beaten path. Table 5.2 provides an overview of some theories that you will discover in your search, but know that many more theories are already out there (see Saad, 2007, 2013). If you seek to access those theories to develop fresh hypotheses in your research area, all you need is a little curiosity and some courage to venture beyond *JCR*.

When Observing Behavior, Ask about Adaptive Function

Many novel ideas come from observing behavior. You have likely wondered about the reasons why people do a variety of things. But the next time you

observe a puzzling behavior, ask yourself the following questions: Why would the brain have been designed to produce that behavior? What adaptive problem might this behavior function to solve?

Imagine you are at the local shopping mall and you see a flock of women admiring the latest Louis Vuitton handbag. You are curious about why women spend so much money on these kinds of luxury products. There are clearly many proximate reasons for this behavior. For instance, the bag makes women feel good, provides them with a sense of identity, and enhances their self-esteem. But this behavior is also likely to serve some adaptive function(s), even if some consumers might be completely unaware of it.

Consider, for example, whether luxury products such as a handbag might serve some mating function. Past research has found that activating a motive to attract a mate leads men to seek luxury products, suggesting that many male luxury goods function to attract mates (Griskevicius et al., 2007; Sundie et al., 2011). What about women? Activating a motive to attract a mate does *not* lead women to seek luxury products (Griskevicius et al., 2007; Sundie et al., 2011). However, activating a motive to guard a mate does lead women to seek luxury products (Wang & Griskevicius, 2014). In fact, women often use luxury goods to send signals specifically to other women, telling them to "back off my man." Just as in the spicy foods example earlier, considering the adaptive function of a behavior led researchers to formulate novel hypotheses that otherwise might have remained hidden from view.

Go to the Zoo

The two authors of this chapter are personally fascinated by animal behavior. In fact, we meet many consumer scientists who love to go to the zoo or watch television programs about the clever ways that animals solve adaptive problems. But whereas most consumer researchers think of animal behavior as being a separate world from their own research, the reality is that human and animal behavior have much more in common than we think. After all, natural selection applies to both animal *and* human behavior.

Evolutionarily informed theories have been used to study animal behavior for much longer than human behavior. This makes theory and research on animal behavior one of the richest sources for inspiring hypotheses about human behavior. Indeed, the zoo is not only a great place to learn about animals; it's a great place to learn more about ourselves. For instance, imagine that you are at the zoo and you notice that in one exhibit there are six chimpanzees – two females and four males. You watch in amusement as the males are extremely active, swinging from branch to branch, knocking each other over, and wrestling each other to the ground. The females, by contrast, are sitting together quietly. Next door at the orangutan exhibit, you notice the opposite pattern. Here there is one male and three females. And, this time, it is the females who are active, wrestling each other for a spot on the top of the rock where the male is sitting. What is going on here? And might it have implications for humans?

If you do a quick search, you will find a large literature on how animal behavior is influenced by sex ratio – the ratio of males to females in the local environment (Kvanermo & Ahnesjö, 1996; Taylor & Bulmer, 1980). Across different animal species, a scarcity of the opposite sex makes members of the more plentiful sex more competitive. And it turns out that sex ratio also has similar effects on human behavior (Durante et al., 2012). For example, when women are scarce, men become more competitive and impulsive (Griskevicius et al., 2012). As with many evolutionarily directed effects, people usually have no idea that their behavior is being influenced by the local sex ratio. Nevertheless, one way researchers could identify such effects in humans is by first considering research and theory in animal behavior.

Roadmap for Future Research

Evolutionary psychology is not a field or an area of research. Instead, an evolutionary perspective is a broad way of thinking about behavior in any domain. Because all human behavior includes an evolutionary explanation, an evolutionary perspective can be useful for generating theories and ideas for any area of consumer behavior (Saad 2007, 2013). For example, an evolutionary perspective is useful for helping make sense of the many errors and biases people make, including helping predict when and why people will make specific types of errors (Kenrick & Griskevicius, 2013). This approach is also highly relevant for understanding environmental behavior and conservation. By better understanding how our evolved tendencies contribute to modern-day problems, we can create better interventions to solve these problems (Griskevicius, Cantú, & van Vugt, 2012). Whatever topic you're interested in, an evolutionary perspective can help you think more broadly about that topic and help generate novel ideas. In the subsections that follow, we highlight a few consumer areas in which an evolutionary perspective is likely to be particularly useful for future research.

Consumption in Relationships and the Family

It begins with dinner and a movie. With any luck, an engagement ring follows. Before we know it, we are buying our first home, deciding on vacation destinations, filling out a will, and saving for our children's college tuition and eventually our retirement. Spending decisions permeate our close relationships. However, little consumer research has examined the factors that can impact the financial decisions we make in our dating, marriage, and family life. For example, we know surprisingly little about the factors that influence how our romantic partners affect our spending and even less about how parents make spending decisions on behalf of their children. Because family and romantic relationships have long been a part of human life, an evolutionary perspective is

highly useful for understanding behavior in these domains. In fact, Table 5.2 highlights many evolutionarily informed theories central to the domains of kin, family, and romantic relationships.

Most research on consumer choice assumes that decisions are usually made by individuals and that these decisions are based on an individual's personal attitudes, beliefs, and preferences. Yet, much consumer behavior – from joint decisions to individual choices – is directly or indirectly shaped by people with whom we have some relationship (Simpson, Griskevicius, & Rothman, 2012). An evolutionary perspective highlights that there are fundametally different goals in a relationship (e.g., mate attraction vs. mate retention), and that people pursue different types of mating strategies (e.g., long-term vs. short-term strategy) (Buss & Schmitt, 1993; Gangestad & Simpson, 2000). For instance, one partner might be more committed to maintaining the relationship than the other. Conditions that alter the quality and availability of alternative mates should shift the value of certain consumer products that relationship partners use to signal their value as a mate. For men, this could include products that signal their commitment, willingness, and ability to invest resources in a partner (e.g., jewelry, exotic vacations, designer clothes). For women, this could include products that signal youth and fertility (e.g., botox, cosmetics, diet plans).

The central evolutionary function of romantic relationships is that they facilitate the rearing of children by enabling two individuals to pool their resources and forge a long-term alliance. Doing so improved the survival and long-term reproductive fitness of offspring during evolutionary history (Geary, 2000). Indeed, field research on hunter-gatherer groups that resemble our ancestors' way of life has shown that children are significantly more likely to survive and thrive when they are raised by two cooperative parents than by one single parent (Hill & Hurtado, 1996; Hurtado & Hill, 1992; Hurtado, Hill, Kaplan, & Hurtado, 1992). Therefore, decisions about investment in children were likely critical across human history, yet little consumer research has considered the factors that influence parental spending.

As one example, evolutionary models predict that investment in offspring should differ depending on the offspring's *reproductive value*, which is the child's ability to convert parental resources into reproductive success by having children of their own (Daly & Wilson, 1988). The Trivers-Willard hypothesis suggests that parents should invest more in one gender over the other depending on whether resources are scarce or abundant (Trivers & Willard, 1973). Indeed, findings show that poor economic conditions lead people to spend more money on daughters compared to sons (Durante, Griskevicius, Redden, & White, in press). Future reseach is poised to examine the many ways our ancestral history shapes modern family spending.

Men's and Women's Consumption across the Lifespan

An evolutionary perspective highlights that males and females share important similarities and have important differences. For example, men and women have

historically solved some evolutionary problems such as disease avoidance in similar ways, meaning that the sexes are expected to differ little when it comes to their psychology of avoiding pathogens. But males and females have historically solved other evolutionary problems, such as mate acquisition, in very different ways, suggesting that the sexes are likely to differ in predictable ways when it comes to mating (Buss & Schmitt, 1993).

Many behavioral sex differences are rooted in the biological sex difference of minimum parental investment (Kenrick, Sadalla, Groth, & Trost, 1990; Trivers, 1972). In any mammalian species such as humans, reproduction requires females to invest more biologically than males. Whereas females must *at a minimum* carry an energetically hungry fetus for several months and then nurse it afterward, males do not. Instead, males have historically contributed to successful reproduction in other ways. This sex difference in parental investment produces a universal sex difference in mate preferences. Whereas women place more value on men's resources, men place more value on women's cues to fertility, such as attractiveness and youth. One implication is that men should be more interested in products that display their wealth and ability to obtain resources, whereas women should seek products that advertise their youth and attractiveness.

Higher parental investment by females also means that females will be choosier about which males will suffice as mates, especially if the male might not stick around to contribute any resources. As a consequence, males have to compete more vigorously to be selected as mates by a choosy female. This suggests that males should generally be more willing to take risks and more strongly discount the future, especially when doing so could attain status or a mate.

Surprisingly little research has considered systematic similarities and differences in men's and women's consumer behavior. An evolutionary perspective provides a theoretical foundation for examining how, why, and when men and women should differ – and should be similar – in their consumption tendencies and decision making.

An evolutionary perspective is also useful for understanding how consumer behavior changes across the lifespan. This approach highlights that organisms proceed through three distinct stages across the lifespan: (1) a somatic growth stage lasting from birth to puberty, (2) a mating stage lasting from puberty until parenthood, and (3) a parenting stage that (for humans) includes grandparenting. Because individuals need to solve specific evolutionary challenges during each life stage, preferences and behavior are likely to change in systematic ways as a function of life stage. For example, to the extent that men's conspicuous consumption functions to help solve the evolutionary challenges of status and mate acquisition (Griskevicius et al., 2007; Sundie et al., 2011), we would expect that men have the strongest desire for flashy luxury products in the mating stage. This desire for conspicuous luxuries should decrease as men age and become parents. But if an older man finds himself back on the mating market (and hence back in the mating stage), his desire for conspicuous luxury products may increase once again.

Surprisingly little research has considered changes in consumer behavior across the lifespan. An evolutionary perspective provides a fruitful theoretical foundation for examining how, why, and when consumption tendencies and decision making change across the lifespan.

Childhood Environment and Personality

Not all people are the same. An evolutionary perspective highlights that many important individual differences between people are linked to a person's life history strategy (Ellis, Figueredo, Brumbach, & Schlomer, 2009; Griskevicius et al., 2013). Across species, life history strategies vary on a fast–slow continuum. Some individuals follow faster strategies, and others follow slower strategies. Life history strategies are related to important differences in mating. Fast strategists start puberty at earlier ages, have sex at earlier ages, and have more sexual partners. By contrast, slow strategists tend to start puberty at later ages, have sex later in life, and have fewer sexual partners, preferring monogamous relationships. But fast and slow strategies are also associated with vastly different psychologies and orientations to decision making. Whereas fast strategists tend to be short-term opportunists and take immediate benefits with little regard for long-term consequences, slow strategists tend to be long-term planners who delay immediate gratification to increase future payoffs (Griskevicius, Tybur, Delton, & Robertson, 2011; Griskevicius et al., 2013).

Research shows that the nature of one's *environment early in life* is a critical determinant of adult life history strategy (Griskevicius et al., 2011, 2013). Similar to how a person's childhood environment is a critical period for acquiring a language, a person's childhood environment is a critical period for calibrating his or her life history strategy (Belsky, Schlomer, & Ellis, 2012; Simpson et al., 2012). Resource-abundant environments tend to be safer and more stable, making a slow strategy adaptive because such environments are relatively predictable and are not expected to change dramatically over time. By contrast, resource-deprived environments calibrate a faster strategy (Ellis et al., 2009; Griskevicius et al., 2011, 2013). Resource-deprived environments tend to be harsh and unpredictable, making a fast strategy adaptive, because in such constantly fluctuating environments it is difficult to know what tomorrow will bring or whether tomorrow will come at all.

Being a fast or a slow life history strategist is a fundamental evolutionary individual difference. This individual difference has a plethora of implications for decision making and consumer behavior. For example, fast and slow strategists might seek very different types of luxury products. Fast strategists might desire flashy luxury goods, seeking loud brands and readily visible goods, such as bright sports cars. By contrast, slow strategists might desire inconspicuous luxury products, seeking quiet brands and products that attract less attention, such as a beige luxury sedan. In summary, an evolutionary perspective provides powerful theories for studying how consumer behavior is shaped by important individual differences.

Strengths, Limitations, and Conclusion

Strengths

Incorporating an evolutionary perspective provides several benefits. First, it provides consumer researchers with a key to unlock hypotheses about behavior that might have never been generated. Indeed, many of the findings discussed in this chapter were generated because an evolutionary perspective provided ideas about new effects or new moderators. For example, an evolutionary perspective on emotions highlights that different emotions serve different adaptive functions (Neufeld & Griskevicius, 2014). By using the theorized function of each emotion as a starting point, it is possible to derive novel hypotheses regarding how and why specific emotions should influence psychology and behavior (Griskevicius, Shiota, & Neufeld, 2010). For instance, previous research shows that positive emotions produce a "rose-colored-glasses" effect by making products more attractive. However, different positive emotions have unique effects, and specific positive emotions can actually decrease the desirability of some products (Griskevicius, Shiota, & Nowlis, 2010). Consider the emotion of pride. The evolutionary function of pride is to motivate public displays to draw positive attention to oneself. Consistent with this function of pride, feelings of pride enhance attractiveness of products useful for public positive differentiation. However, pride does not enhance the attractiveness of products used primarily around the house – and sometimes even decreases their desirability. Thus, rather than positive emotions always producing a rose-colored-glasses effect, different positive emotions produce an emotion-specific and evolutionarily functional pattern of perceptions and evaluations.

Second, an evolutionary perspective can help explain and build on well-established behavioral phenomena. Take, for example, classic findings on conformity. People are found to be heavily influenced by the actions and beliefs of others and often pattern their own behavior and choices after those around them (Asch, 1956; Cialdini, Reno, & Kallgren, 1990; Sherif, 1936). When considering conformity through the lens of the fundamental motives framework (see Table 5.2), it was found that conformity effects are even stronger when people are motivated to protect themselves from danger (Griskevicius et al., 2006). However, activating mating motives led to a reversal of classic conformity effects, leading men to go against the group when they were motivated to attract a mate.

An evolutionary perspective also helps avoid isolated islands of research by helping scholars think about the bigger scientific picture. For example, researchers working only at one level of analysis (such as by focusing only on Tinbergen's first question) can end up building isolated islands of research that have little connection to other research. However, by thinking about multiple levels of analysis – and by realizing that all findings have to fit together logically across different types of explanations – researchers are more likely to do research that better connects to the work of other scholars within and outside

their field. At the end of the day, the theories and findings published in the *Journal of Consumer Research* have to fit together with the theories and findings published in the journal *Evolution and Human Behavior*. Evolutionarily informed theories provide an underlying logic that helps connect all the pieces of the puzzle of human behavior.

Limitations

Although an evolutionary approach provides multiple benefits, it is also important to highlight its limitations. One limitation is that an evolutionary perspective has difficulty explaining certain phenomena. For example, consider homosexual orientation, which is a Darwinian paradox. Exclusive homosexual orientation seems to defy evolutionary logic since it seems to fail to increase an individual's reproductive success. Although evolutionary hypotheses have been proposed for homosexuality, none have received empirical support thus far (e.g., Bobrow & Bailey, 2001).

Another limitation is that we lack detailed knowledge of many selection pressures that humans faced over the millions of years of their evolution. We do not possess a time machine or a video of deep time that would reveal in precise detail all of the selective events over millions of years that have led to the current design of the human body and mind. Nonetheless, this limitation is not total. There is a surprisingly abundant amount of information about the human ancestral environment that we do know to a reasonable degree of certainty (Confer et al., 2010). For example, ancestral humans "had two sexes; chose mates; had color vision calibrated to the spectral properties of sunlight; lived in a biotic environment with predators; were predated on; bled when wounded; were incapacitated from injuries; were vulnerable to a large variety of parasites and pathogens; had deleterious recessives rendering them subject to inbreeding depression if they mated with siblings" (Tooby & Cosmides, 2005, pp. 23–24).

Scientists also know that fertilization occurred internally within females, not within males; that females, not males, bore the metabolic costs of breastfeeding; that our ancestors engaged in hunting for at least the past one million years; that our ancestors lived in small groups, ranging in size from a few dozen to 150; and that our ancestors made and used tools for hunting, gathering, cooking, and warfare. We also know that bipedal locomotion, extended childhood, long-term pair bonds, biparental investment, and relatively concealed ovulation distinguish our ancestors from their closest primate relative, the chimpanzee.

Evolutionary psychologists also use evidence from anthropology, archaeology, primatology, comparative biology, and ethology to elucidate some aspects of an otherwise scientifically uncertain ancestral past. For example, the paleontological evidence is rife with ancient caches of skulls and skeletons showing patterned lethal injuries, corresponding in size and shape to ancient weapons discovered in the vicinity. When combined with cave art depictions of fighting and many other sources of evidence, the cumulative findings yield reasonable inferences that human warfare was a potent hostile force of nature

for human ancestors, that males were far more often perpetrators and victims of homicide than females, and that the majority of ancestral attackers were right handed (Duntley & Buss, 2012).

In summary, although convergent evidence from independent data sources yields especially reasonable inferences about *some* past selection pressures, evolutionary psychology, and indeed the entire field of psychology, will always be limited by incomplete knowledge of past selection pressures.

Conclusion

On university campuses, there is a long-standing division between the social and the natural sciences. Generations of researchers studying ecology and biology have been physically divided from those studying psychology and economics. Although scholars on both sides are studying behavior, this wall has led people on one side to be generally unaware of the theory and research on the other side. This division has spawned continued isolation, leading various fields to become ever more insulated.

It is time to tear down this wall. Charles Darwin wrote that, "In the distant future, I see open fields for more important researches. Psychology will be based on a new foundation" (Darwin, 1859). It has been over one hundred years, but Darwin's vision is beginning to be realized by scholars across the behavioral sciences. The current generation of scholars is poised to tear down this wall by incorporating evolutionarily informed thinking into their research. As the bridge between the natural and social sciences becomes stronger, future generations of researchers are poised to build a truly interdisciplinary science of behavior.

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