Chapter 12: Introduction to Module 2—Evolution

Fruit Flies and Bananas

You and I have two eyes. They are located in the front of our face, point outward, and are slightly recessed into the skull. Each of our eyes has one lens and one retina. We do not have eyes like a fruit fly (Drosophila)—large, multilensed, bulbous structures protruding far outside the head and occupying almost a quarter of the head’s space. In many ways, we would be better off having the eyes of a fly. Except for the obstruction imposed by the head and body, we would have a completely unencumbered, 360-degree view of the world. We would not have to move out heads around—or, for that matter, our whole bodies—to see what was behind us, and there would be no need to turn our heads to look both ways before crossing a street.

I eat bananas. Most of you reading this probably do too. Fruit flies also like bananas, a fact that many of use are aware of from having left our bananas too long in their brown paper bag.

What do eyeballs and bananas have in common? And why do I keep talking about fruit flies? The reason is genes. Our genes determined the format of human photography, film, and video. They also determined the whole production, distribution, and sales schedules for getting bananas from trees onto our breakfast cereal. And we can see how human genes play this role by looking at fruit flies.

Imagine for a moment that fruit flies had evolved the incredible intelligence and technology that permitted them to develop their own brand of photography and
agriculture. What would a Drosophila photo look like? It certainly would not be the
typical two-dimensional image that you and I get back from Kodak. Any self-respecting
fruit fly would find such an image quite disturbing and would immediately ask, “Where
is the top, the two sides, the back, and the bottom?” Their perception of such an image
would be as whimsical to a fly as yours and mine would be to an Ansel Adams
photograph that contained only the three inch square central part with the outer section
thrown away.

A Drosophila television set would be the antithesis of the “flat screen” touted by
advertisers for higher-end human consumption. It would be a spherical object into which
the tiny fruit fly could insert its head. The inside of the sphere would be the TV screen
and the image would be projected along the whole 360 degrees of the inside so the viewer
could appreciate what was happening simultaneously in the front, back, sides, top, and
bottom. Just as us humans appreciate surround sound, the discerning Drosophila
videophile would tolerate nothing less than surround sight.

And bananas? We humans all know the developmental life cycle of a banana. In
“adolescence,” the banana has yet to reach even the green stage that most of us find
unpalatable; it has such exceptional hardness that some liberal-minded states would ban it
as a lethal weapon except for the fact that we never get to see it in such a condition. We
only encounter bananas in the supermarket when they reach “early adulthood.” Here,
they are green, hard, and to many of us, indigestible. If the fruit section contains only
these types of bananas, we have three choices: (1) check out the raspberries instead; (2)
go to another store; or (3) buy them, keep them in a brown paper bag, and wait until they
reach complete “maturity and ripeness” when they turn bright yellow and soften. By choosing the third option, we always run the risk that neglected bananas will enter the “over the hill” stage where the skins turn black and the actual fruit is useful only for making banana bread.

The Drosophila who just read the above paragraph would be so incensed that it would fly to the nearest lawyer and press civil rights charges against me for “speciesism.” Although the little critter might not take offense with the terms “adolescence” and “early adulthood,” it would rightly be offended by the stages that I describe as “maturity” and “over the hill.” The Drosophila supermarket would never offer green or yellow bananas. Instead, it would display only bananas that have turned black and the blacker the banana, the better. While many humans would feel squeamish even handling a black banana with insides the consistency of yogurt, the Drosophila would find such a fruit the epitome of haute cuisine.

The reason, according to psychologist David Barash (1982), is in our genes. We primates have an efficient metabolic system for the sugars in fruit. To obtain optimal nutritional content from fruit, we should eat it when the sugar content is high. Evolution has effectively tricked us into doing this by giving us taste buds and central brain mechanisms that respond to sugar as “pleasurable.” As Barash puts it, that is why we find sugar sweet while an anteater might take equal delight experiencing a horde of termites biting its tongue.

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1 The banana example was inspired from a passage by David Barash (1982) on why we humans find that sugar is sweet.
2 Once again, I warn the reader that evolution has no forethought or design. The “trickery” that I attribute to it is a literary convention.
Fruit flies, on the other hand, have a wonderful metabolic system for the digestion of alcohols. As fruit becomes “overripe,” as we humans would have it, the sugars ferment into alcohol. As the alcohol content increases, the fruit becomes more nutritional for the Drosophila. If Drosophila have pleasure centers in their tiny brains, then a completely mushy, semi-fermented banana is as delectable to them as a sweet, ripe strawberry is to us.

To understand human behavior, we must understand evolution. So argue the proponents of a growing field of the social sciences called evolutionary psychology. The above example illustrates what has become to be known as **biological constraints** on human behavior. Generally defined, biological predispositions and constraints are mechanisms that have evolved over time to make it more likely that we behave in one way rather than other ways. Of all the possible ways of enjoying a banana, our evolutionary history has shaped us to enjoy the fruit only a certain stage in its development. Because of similar evolutionary constraints, our forward-facing, binocular vision makes us quite content to enjoy flat, two-dimensional visual images. Module 2, Evolution and Evolutionary Psychology, highlights the **sameness** of humans and asks questions like, “Why do all humans use spoken language?”, “Why can’t we humans smell odors as well as most other species?”, and “Why are humans social?”

**Description, Etiology, and Evaluation**

The generic issue of genes, evolution and behavior is a politically and philosophically charged topic. To appreciate this module of the book, it is essential to distinguish among **descriptive**, **etiological**, and **evaluative** statements. “The sky is blue”
is a descriptive statement. “Why is the sky blue?” is an etiological question. “Should the sky be blue?” is an evaluative issue. Too often, students who are wedded to a particular etiological cause or evaluative judgment erroneously deny the validity of a descriptive statement because it conflicts with their idea of what “caused this” or what “should be.” Be careful of this error.

The issue will be most pressing in the discussion of evolutionary psychology and to illustrate the problem, consider two descriptive statements: (1) “Humans eat and enjoy fruit when its sugar content is close to maximum;” and (2) “Men report a higher premium on physical attractiveness in a potential mate than women, while women say they want resources and security in a mate more often than men do.” Few if any, of you readers would experience an emotional reaction to the first statement, but a significant number will have a negative, visceral response to the second because it smacks of sexism. There is absolutely nothing wrong with a negative reaction to the statement on mate preferences—that, after all, is part of an evaluative judgment. The error is to let this negative evaluation call the validity of the descriptive statement into question.

Consider the process by which this statement was constructed. Researchers administer the same forms with the same instructions to men and women. Men and women then fill the forms out differently and the researchers report this fact. The statement on mate preferences is a simple descriptive statement of what happened in the research. It is as true as the statement “the sky is blue.”

Students will frequently attack these descriptive statements, along with the researchers who made them, because the descriptive statements contradict their views of what “should be”. According to them, researchers who report that men place a higher
emphasis on physical attractiveness than women in a mate are “sexist” because men and women should have the same values in mate preferences. In fact, the researchers are not making this conclusion. The men and women who filled out the forms simply differed in their responses and the researchers are accurately reporting this difference. The researchers are making a simple descriptive statement. There may be very legitimate disagreements about the etiology of the sex difference in mate preferences and about the “should be” of these differences. However, these disagreements should never obfuscate the simple, declarative reporting of the sex difference in the first place.

The real area of debate should target etiological explanations of descriptive statements, not the descriptive statements themselves. “Why do men and women differ in these aspects of mate preferences?” is quite a different issue than reporting the observation in the first place. Here, evaluative judgements actually play an important role in the process of scientific inquiry. They force researchers to confront methodological problems, they encourage the scientist to develop different strategies for looking at the problem, and they ultimately result in a greater amount of knowledge.

The Naturalistic Fallacy

The naturalistic fallacy attributes a moral rectitude or correctness to a phenotype developed through evolution. This is one of the most important myths to guard against because it is most often misused in the science of genetics and human behavior. We humans engage in many morally opprobrious behaviors that may be influenced in some way or another by our evolutionary history. Extreme jealousy is a mild example; murder and warfare are extreme cases. If there is an evolutionary backdrop for human violence,
then the naturalistic fallacy would state that violence is morally justified because we humans have some type of biological underpinning for violence.

The philosopher G.E. Moore explicated the naturalistic fallacy in 1903\(^3\). In its simplest form, it equates “what actually is” with “what actually ought to be” and confuses a descriptive statement (“The sky is blue”) with an evaluative statement (“The sky ought to be blue”). It is very easy to follow the fallacious reasoning when applied to the color of the sky. The fallacy becomes much more seductive and tempting once human behavior becomes the content of discussion.

Once again, evolution is a process that follows certain rules but lacks insight, intentions, and morals. Observing that young adult males are at high risk for committing violence is a descriptive statement. Attributing young adult violence to an evolutionary mechanism is an etiological hypothesis. Permitting young adult violence to occur is a moral decision. We humans are the ones that must make the moral decisions and take responsibility for the outcomes of our decisions.

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\(^3\) see Wright (1994, p. 330 ff) for a brief but excellent summary of the historical problem.
References
