**Discussion Questions**

to accompany

***Animal Behavior,* Eleventh Edition**

by Dustin Rubenstein and John Alcock

**Chapter 14**

**Human Behavior**

14.1 Another way to explore the origins of language involves a comparison of the number of phonemes (the simplest speech sounds that are used together to make up word sounds) in modern languages. It turns out that the languages with the greatest numbers of phonemes are African, whereas languages spoken by peoples whose dispersal routes took them farthest from Africa have the fewest phonemes. This result parallels the finding that the greatest amount of genetic diversity is found in African populations, with the least in peoples whose ancestors moved the farthest from Africa. The genetic result is attributed to the fact that as humans moved farther and farther from Africa in stages, each new colonizing group was small and so did not possess all the genetic alleles found in the population from which it came. If we apply this kind of argument to language diversity, where did the first language-using members of *Homo sapiens* live? Since language evolution is culturally controlled (Mesoudi 2007), does it make sense to apply techniques developed for genetic evolution to this case?

14.2 The first vocational school for deaf children in Nicaragua was opened in 1981. Although the children at the school had never been taught a sign language, they invented one of their own that became increasingly complex (Senghas et al. 2004). This unique language has many of the fundamental properties of all other languages, including the breakdown of information into discrete units and a grammatical presentation of words (gestures in this case). In discussions about the levels-of-analysis approach to language-learning ability in human beings, what is the significance of the children’s behavior?

14.3 Considerable disagreement exists about the extent to which our brains are composed of well-defined modules, each shaped by selection to carry out specialized tasks, as opposed to a brain composed of generalized networks with much functional plasticity. In light of this argument, what do you make of the following findings? Humans are extremely good at recognizing familiar faces, thanks to various elements of the brain. Persons with certain kinds of damage to the fusiform gyrus, which is on the underside of the cerebral cortex, lose the ability to recognize familiar faces, a deficit much more likely to occur after damage to the right hemisphere of the brain (Ellis and Young 1996). (See *The Man Who Mistook His Wife for a Hat* by Oliver Sacks; (Sacks 1985). Functional magnetic resonance imaging reveals that neurons in a small part of the posterior fusiform gyrus, the facial fusiform area, fire only when a person looks at a face. This part of the brain does not respond to pictures of inanimate objects, although another nearby region of the brain does (McCandliss et al. 2003).

14.4In the past, aspiring London taxicab drivers underwent a rigorous education that required them to learn the location of about 25,000 streets in the city. The average posterior hippocampus of London cabbies, as revealed by magnetic resonance imaging, was larger than that in a comparable group of London bus operators, who follow a fixed route and so do not have to learn a detailed map of the city (Maguire et al. 2000). In addition, the more years of taxi driving, the larger the posterior hippocampus (Maguire et al. 2006). What does this research tell us about the interplay of the environment and genetics in the development of adaptive navigational skills in human beings?

14.5 Humans are cultural animals. As such, we have major differences between cultures in the behavior of people, as illustrated by the 5000 or so languages spoken within historical times in the world. Exposure to a particular language leads children to adopt that language. A popular view in some circles is that the behavioral differences between men and women likewise stem largely from exposure to a culture’s view of how males and females should behave. In our culture, young boys typically receive guns and miniature trucks to play with while young girls get dolls and baby carriages. Cultural stereotyping of this sort is said to push boys into “masculine roles” while guiding girls into culturally approved “feminine roles.” Two researchers gave young male and female monkeys both types of toys and measured the amount of time they spent with each kind of toy (Alexander and Hines 2002). Why did they do this? How could the evidence they gathered help them test the cultural stereotyping hypothesis?

14.6 How might the following findings be understood in terms of the adaptive value of female mate preferences? Deep-voiced men have more children in a traditional hunter-gatherer culture, the Hazda of Tanzania. Taller men are more likely to be chosen in speed-dating competitions than their shorter rivals (Belot and Fancesconi 2006) and are more likely to be chosen as sperm donors by women in California (Egan 2006). Images of men with slightly bloodshot eyes are judged less attractive than photographs of the same men in which the whites of the eyes are clear (Provine et al. 2011).

14.7 Although women seem to prefer wealthy men, in most modern cultures high family income is not positively correlated with the number of children produced. Indeed, poor couples often have more surviving children than do rich ones. Does this finding invalidate an evolutionary analysis of human behavior, as some believe (Vining 1986)? You might want to contrast aspects of the current human environment with our ancestors’ environment. Can you make use of the finding that in preindustrial Finland, for women of high fecundity, the number of surviving offspring was less in resource-poor landless families than in landowning families (Gillespie et al. 2008). Also fit the following finding into your analysis: in a survey of modern data from 145 countries, human fertility was negatively linked to population density (Lutz et al. 2006).

14.8In this chapter we have offered the fertility hypothesis for the male preference for women with an hourglass figure. Produce a different hypothesis for this sexual preference, based on the following facts: the body fat stored in a pregnant woman’s lower body is of a type that promotes the growth of the fetal brain, whereas upper-body (abdominal) fat differs in its composition and is not used for the development of the embryo’s brain (Lassek and Gaulin 2008). Once you have come up with your hypothesis, use it to produce at least one testable prediction.

14.9 University students were asked to judge the attractiveness of different versions of faces that had been digitally altered to change the vertical distance between the eyes and mouth as well as the horizontal distance between the eyes (Pallett et al. 2010). The students preferred those images in which the relevant vertical distance was about 36 percent of the face’s length and the horizontal distance between the eyes was 46 percent of the face’s width. These proportions are those found in average faces. In evolutionary terms, why might men prefer faces with average structural features?

14.10 If two blue-eyed people have children, all their offspring will have blue eyes, whereas brown-eyed individuals who reproduce may have children with various eye colors. Blue-eyed men find blue-eyed women more attractive than brown-eyed women (Laeng et al. 2007). How might an evolutionary biologist interpret this finding?

14.11 An FBI database for 1976 to 1994 contains the records of 14,000 homicides in which a husband killed his wife (Shackelford et al. 2003). Younger women were far more likely to be victims than older women in cases involving a lovers’ triangle. Analyze this result as dispassionately as you can in terms of the potential fitness costs and benefits to the killer husband. With these fitness effects in mind, consider the possibility that wife killing in the context of potential infidelity is an evolved adaptation. Contrast this possibility with an alternative explanation, namely, wife killing occurs as a side effect of extreme sexual jealousy by males.

14.12 Mate guarding is an evolved response to sperm competition. Chimpanzee (*Pan troglodytes*) females regularly mate with several males in the same estrous cycle, whereas gorilla (*Gorilla* *gorilla*) females almost never do, since they typically live in bands, each controlled by a single, powerful male. How large (as a proportion of body size) should the testes of chimpanzee males be relative to gorilla testes (Harcourt et al. 1981)? If the testes of men are more similar to those of chimpanzees, what would this tell us about the intensity of sperm competition during our evolutionary past? If, on the other hand, human testes resemble those of gorillas, what conclusion is justified?

14.13 Natalie Angier states that married men have the same probability of fertilizing an egg per copulation with their wives as rapists do when forcing copulation on a victim (Angier 1999). Over history, the survival probability for an offspring of a married man has almost certainly been much higher than that for a rapist’s child, because married men have often assisted their children, whereas rapists have not. Is Angier correct, therefore, in claiming that rape cannot be an adaptive tactic? (Remember that *adaptive* means “reproductively useful.”) What do you make of the fact that low-status men are more likely to rape women unknown to them, whereas high-status men dominate the category of acquaintance or partner rape?

14.14Use an evolutionary approach to explain why people will give substantial tips to waiters and waitresses whom they do not know and whom they will never meet again.

14.15 Marshall Sahlins argued that sociobiology is contradicted because people in most cultures do not even have words to express fractions. Without fractions, a person cannot possibly calculate coefficients of relatedness, and without this information (Sahlins claims), people cannot determine how to behave in order to maximize their indirect fitness (Sahlins 1976). Did Sahlins deliver a knockout blow to sociobiological theory?

14.16 Philip Kitcher states that “socially relevant science,” such as sociobiology, demands “higher standards of evidence” because if a mistake is made (a hypothesis presented as confirmed when it is false), the societal consequences may be especially severe. For example, a hypothesis that men are more disposed to seek political power and high status in business and science than women is dangerous because it “threaten(s) to stifle the aspirations of millions” (Kitcher 1985). Is Kitcher right?

References

Alexander, G. M., and Hines, M. 2002. Sex differences in response to children's toys in nonhuman primates (*Cercopithecus aethiops sabaeus*). *Evolution and Human Behavior* 23: 467–479.

Angier, N. 1999. *Woman, An Intimate Geography*. New York: Houghton Mifflin Company.

Belot, M., and Fancesconi, M. 2006. *Can anyone be “the one”? Evidence on mate selection from speed dating*. London: Center for Economic Policy Research. www.cepr.org/active/publications/discussion\_papers/dp.php?dpno=5926.

Egan, J. 2006. Wanted: A few good sperm. *New York Times Magazine*,March 19.

Ellis, A. W., and Young, A. W. 1996. *Human Cognitive Neuropsychology*. East Sussex, UK: Psychology Press.

Gillespie, D. O. S., Russell, A. F., and Lummaa, V. 2008. When fecundity does not equal fitness: Evidence of an offspring quantity versus quality trade-off in pre-industrial humans. *Proceedings of the Royal Society B* 275: 713–722.

Harcourt, A. H., Harvey, P. H., Larson, S. G., and Short, R. V. 1981. Testis weight, body weight and breeding system in primates. *Nature* 293: 55–57.

Kitcher, P. 1985. *Vaulting Ambition*. Cambridge, MA: MIT Press.

Laeng, B., Mathisen, R., and Johnsen, J. A. 2007. Why do blue-eyed men prefer women with the same eye color? *Behavioral Ecology and Sociobiology* 61: 371–384.

Lassek, W. D., and Gaulin, S. J. C. 2008. Waist-hip ratio and cognitive ability: Is gluteofemoral fat a privileged store of neurodevelopmental resources? *Evolution and Human Behavior* 29: 26–34.

Lutz, W., Testa, M. R., and Penn, D. J. 2006. Population density is a key factor in declining human fertility. *Population and Environment* 28: 69–81.

Maguire, E. A., Gadian, D. G., Johnsrude, I. S., Good, C. D., Ashburner, J., et al. 2000. Navigation-related structural change in the hippocampi of taxi drivers. *Proceedings of the National Academy of Sciences* *USA* 97: 4398–4403.

Maguire, E. A., Wollett, K., and Spiers, H. J. 2006. London taxi drivers and bus drivers: A structural MRI and neuropsychological analysis. *Hippocampus* 16: 1091–1101.

McCandliss, B. D., Cohen, L., and Dehaene, S. 2003. The visual word form area: Expertise for reading in the fusiform gyrus. *Trends in Cognitive Sciences* 7: 293–299.

Mesoudi, A. 2007. Biological and cultural evolution: Similar but different. *Biological Theory* 2: 119–123.

Pallett, P. M., Link, S., and Lee, K. 2010. New “golden” ratios for facial beauty. *Vision Research* 50: 149–154.

Provine, R. R., Cabrera, M. O., Brocato, N. W., and Krosnowski, K. A. 2011. When the whites of the eyes are red: A uniquely human cue. *Ethology* 117: 395–399.

Sacks, O. W. 1985. *The Man Who Mistook His Wife for a Hat and Other Clinical Tales*. New York: Summit Books.

Sahlins, M. 1976. *The Use and Abuse of Biology*. Ann Arbor: University of Michigan Press.

Senghas, A., Kita, S., and Özyürek, A. 2004. Children creating core properties of language: Evidence from an emerging sign language in Nicaragua. *Science* 305: 1779–1782.

Shackelford, T. K., Buss, D. M., and Weekes-Shackelford, V. A. 2003. Wife killings committed in the context of a lovers triangle. *Basic and Applied Social Psychology* 25: 137–143.

Vining Jr., D. R. 1986. Social versus reproductive success: The central theoretical problem of human sociobiology. *Behavioral and Brain Sciences* 9: 167–187.