Studyguide 1, Evolutionary Psychology

Evolutionary Theory

1. Understand how natural selection works. What are the three essential ingredients? (Buss 5, lecture)

2. Be able to describe the changes that took place in the Grant's study of the medium ground finch (lecture), and how this example illustrates natural selection.

3. What is sexual selection? (Buss 6-7). Recommended: see Gaulin and McBurney reading (on reserve, assigned for Feb 11)

4. Is natural selection the only cause of evolutionary change? (p. 8)

5. Mendel showed that inheritance is particulate. Why is this important for natural selection? (p. 10)

6. Understand the concepts of kin selection and inclusive fitness (p. 13 and lecture); this will be discussed in more depth later in the course).

7. Why are altruistic traits unlikely to evolve through group selection? (this may not apply to cultural evolution). p. 14 and lecture

8. Natural selection does not produce perfect adaptation. Be able to give at least three different reasons why, and at least one example of each. p. 18–19, Rogers' lecture.

9. Sexual selection gives rise to sexual dimorphism (morphological and behavioral differences between the sexes). Give some examples of traits likely to arise from (a) "male-male competition" (i.e., excluding your same-sex competitiors from mating by force or threat of force) and (b) "mate choice"/"epigamic" selection (i.e., being so attractive that your potential mates choose you rather than your competitors). (lecture 1-23 (no slides))

10. To a biologist, an altruistic trait is one that favors another individual at the expense of the altruist. We reviewed several ways seemingly altrustic traits could evolve. What are they? (lecture).

11. Evolution of social behavior is usually frequency-dependent. What does that mean? Why does it sometimes lead to lower mean fitness for the population? (from Rogers' lecture).

12. Know what a "norm of reaction" is, and what it implies for the nature-nurture debate. ('from genes to behaviour' lecture). Important. Think of a plausible human example NOT discussed in class or lecture.

13. Garcia studied conditioning in rats by pairing a stimulus (lights or tasty water) with a punishment (electric shock or x-ray induced nausea). What were the rats able to learn? (lecture and text). Why general inference can you draw from the result (i.e., why did I bother to talk about this?). How does it refute the assumptions of early behaviorism? (p. 28-9).

14 What do studies of attention in newborns tell us about the interaction between "nature" and

"nurture"? What do they attend to? Why might this be an evolved adaptation? (lecture).

15. Review the concept of heritability (lecture).

16. What is the epigenome? What made the genetically-identical brown and yellow agouti mice so different? (film, lecture).

17. The genes of identical twins are the same – how about their epigenomes? Does it change with age and experience? (film segment).

18. Can maternal behavior cause epigenetic effects?

19. Read the following for the gist, don't memorize details:

a) Take a look at table 1.1 and get a feel for scale and the order of events (*don't memorize details or dates*). About how old is the earth? About when did life begin? Note the landmarks in the text, and at least remember the order of events: mammals, primates, bipedal primates, stone tools, elaborate art. extinction of Neanderthals.

b) Note the shrubby, rather than linear, nature of the human family "tree" figure 1.2 There are many disagreements, and new trees appear in the literature constantly. Most models are shrubby.

c) Read box 1.1 on the origin of modern humans. Don't memorize details.

20. The history described by Buss and lecture shows shifts between the view that much of human behavior is innate ('nature') to the opposite view that there is little innate human nature at all –almost anything could be learned and culture was infinitely variable – to today's more subtle interactionist view.

Evolutionary theory, Reserve reading

Boyd and Silk

Be able to summarize how natural selection shaped the ability to respond to changing environmental conditions in soapberry bugs. Note that the responsiveness (the norm of reaction curve) is itself heritable, and appears to be adaptive. What affects the shape of the curve?

Ridley: Genes are so liberating

1. Genes are not changed by the environment, but their expression is (i.e., the organism's environment and behavior determine when genes are "switched on"). That is how a norm of reaction works.

2. How do montane and prairie voles differ behaviorally, and what does this have to do with vasopressin receptors? (This is a very big behavioral difference from a single mutation!). But nothing happens to vasopressin production in the prairie vole unless he... what?

3. Variation in the promotor region of the MAOA gene affects the likelihood of becoming antisocial, but only under certain conditions. Explain this gene-environment interaction (see also lecture

slides).

Evolutionary Psychology: ch. 2

1. What is the EEA? (p. 39)

2. Evolutionary Psychologists are sometimes accused of assuming that everything is an adaptation. Note Buss's distinction between adaptations, by-products, and noise

3. Do evolutionary psychologists assume evolutionary theory or do they test it? Buss gives examples of lower-level theories that are tested by EP, and points out that these can be falsified without it threatening the validity of the higher-level theories. You can skim this discussion (pp. 41-47).

4. Get the gist of his discussion of evolved psychological mechanisms (pp. 51-55) but you can skim this too. You should know that there is disagreement about how domain-general or domain-specific the mind is, and that some evolutionary psychologists (not me) care a lot about the issue.

5. The discussion of learning, culture, and evolved psychological mechanisms (pp 55-57) is important. Understand the examples he gives for evolved learning mechanisms.

6. pp. 57-65 are skimmable: don't ignore them, but get the gist and appreciate the wide range of methods and data sources used by Evolutionary Psychology. It is truly a multi-disciplinary field.