Women & Men: The Biology of the Sexes
Problem Set 2
Due in class (not emailed or put into my box) on Thurs. Nov. 12, 2009

Instructions: You may consult the readings and your notes but you may not discuss the questions with one another. Must be typed, edited, proofread. Attend to the logic of your explanation. Do not consult the internet; it will simply slow you down and not provide assistance for these original questions. I would prefer that you use your own words in describing various studies rather than quoting directly from the papers. Answer all questions. **Late papers will not be accepted**.

1. Can an XY individual with Androgen-Insensitivity Syndrome (AIS) be given testosterone replacement therapy after birth in order to encourage the development of the male phenotype? Explain.

2. In the 1950s and 1960s, the prevailing wisdom in the medical and psychological community suggested that babies are born *tabula rasa* (blank slate) with regard to their gender identification and that the main influence on gender is in the rearing of the child. Make an argument supporting or refuting that idea citing at least one line of evidence and explaining it.

3. You are comparing two different studies on the heritability of male sexual orientation. The data of Study A and Study B are below:

STUDY A

50% of identical twins (MZ) who are gay have a gay twin
25% of fraternal twins (DZ) who are gay have a gay twin
10% of brothers of gay men also are gay
5% of adopted gay men have a gay adopted brother

STUDY B

50% of identical twins (MZ) who are gay have a gay twin
10% of fraternal twins (DZ) who are gay have a gay twin
10% of brothers of gay men also are gay
5% of adopted gay men have a gay adopted brother

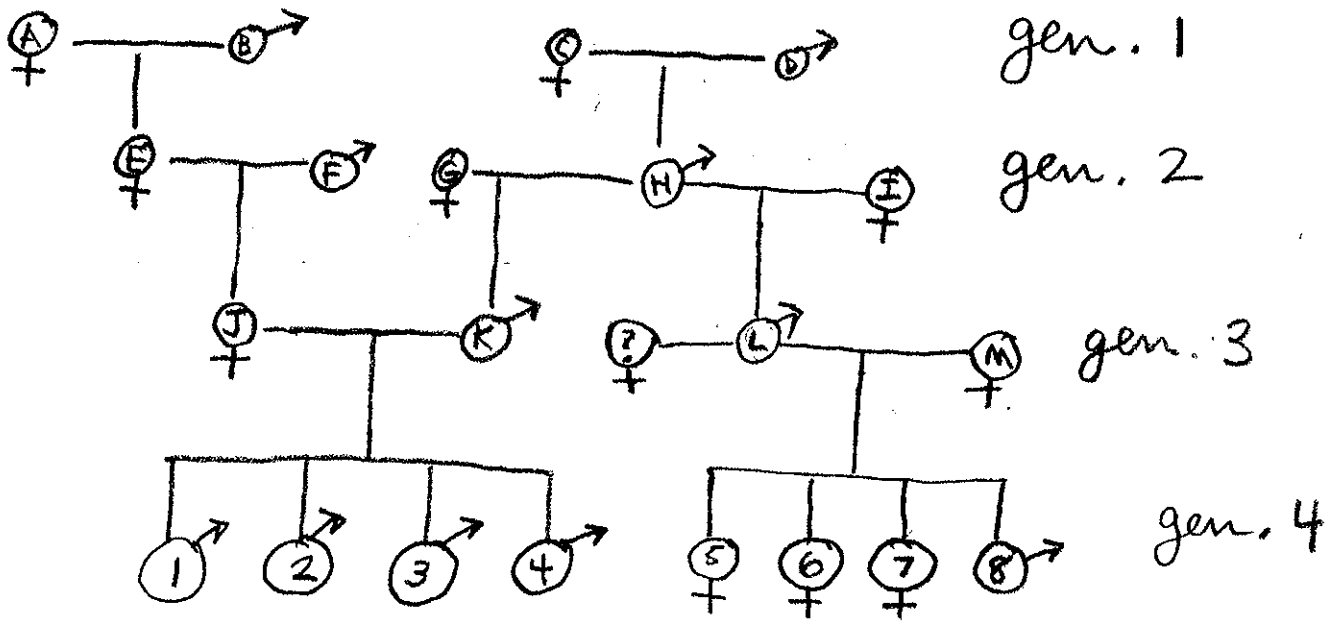
Assume that the methods of the two studies are the same and the populations are similar. Nevertheless, the heritability estimates for the two different studies are not the same. Which study, A or B, would display the higher estimate of heritability, using only the data above? Explain. (Hint: look at the differences between fraternal twins and regular brothers in the two studies).

4. Does the absence of any association between older sisters and the manifestation of male homosexuality strengthen or weaken the H-Y antigen hypothesis? Explain.

5. You have been studying the family tree of a small group of people. Four generations of the people are indicated in the diagram below. If people are missing from the tree (e.g. the parents of male F, all the children of female I) it simply means that you did not have room on the diagram. But the table below reports the fecundity of the people in the tree. Also, in the last generation (gen. 4) the number sequence indicates birth order (e.g. #3 was born before #4; #6 was born before #7).

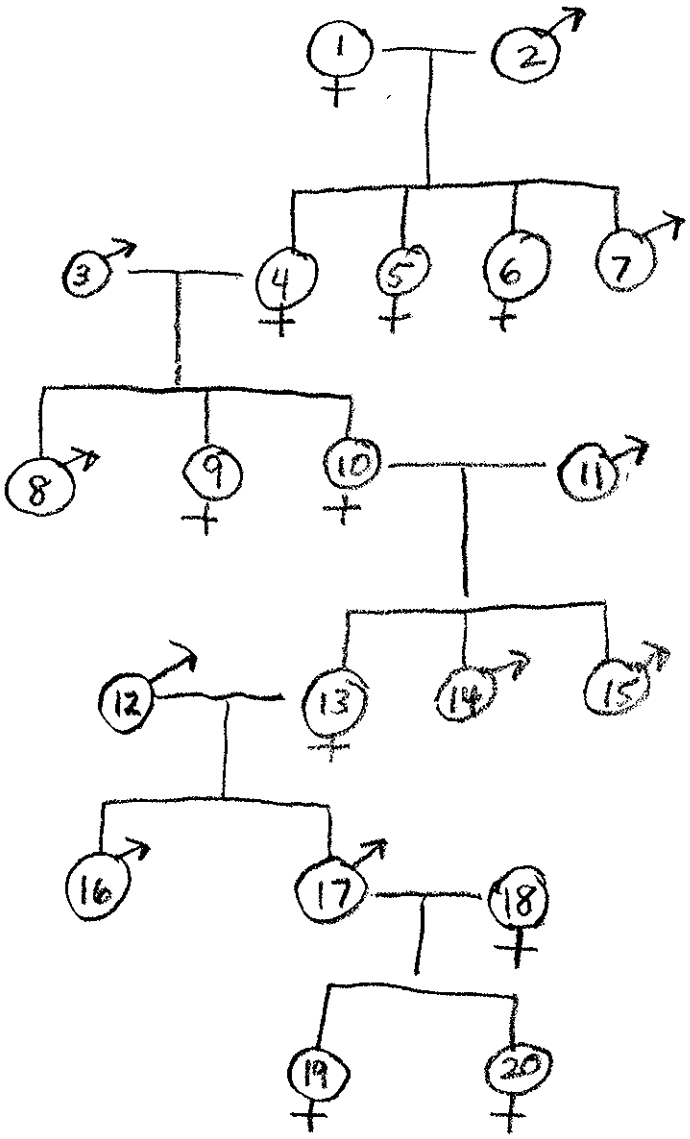
a. Using the information in the table and the diagram, predict which individual, #4 or #8 is more likely to be a homosexual. Explain your reasoning.

INDIVIDUAL	A	B	C	D	E	F	G	H	I	J	K	L	M
FECUNDITY	4	4	2	2	5	5	2	4	2	6	6	7	1



b. Predict the relative sizes of INAH-1 and INAH-3 of individuals #4, #6 and #8. Explain.

6a. The inheritance pattern for hemophilia in a family is shown below. For each individual, indicate the sex chromosomes and what blood clotting gene they bear (either the normal ***H*** or the hemophilia mutation ***h***.) as we did in class. If the family tree does not let you distinguish between two possible genotypes for an individual, list both possibilities. (No explanations necessary here. Just list the individuals by number and indicate their genotypes).



#s 8 and 16 died of hemophilia

b. Assuming that #18 is not a carrier, is it possible that #20 could be a carrier? Explain.