BEHAVIORAL GENETICS PSYCH 3102 DR HEWITT

PRACTICE EXAM II.

Exam II will be made up of questions similar to the examples below and similar to questions you have received on the last 2 homeworks.

Matching

1.A generation of animals expected to differ from each other genetically (eg. The F_2 generation) _____

2.A psychiatric disorder characterized by long-term thought disorders, hallucinations and disorganized speech

3.Twins who are genetically no more alike than ordinary brothers and sisters. _____

4.The process of deciding which type (either MZ or DZ) a pair of twins is. _____

5. A generation of animals not expected to differ from each other genetically. _____

6. An estimate of the additive genetic contribution to variation in a population. _____

7. Twins who are genetically identical. _____

8. An estimate of the total genetic contribution to variation in a population. _____

Possible answers

non-segregating generation narrow heritability MZ twins half siblings backcross
manic depression zygosity determination selection differential schizophrenia
broad heritability DZ twins dominance deviation
segregating generation correlation allele-sharing method
concordance identical-by-descent method

The above section will be longer in your exam – make sure you have learnt and understood all the vocabulary used in the past weeks.

Twin studies

The following table gives the reported correlations for same-sex twins raised together for 4 traits. Assume that the sample sizes are large.

TRAIT	MZ CORRELATION	DZ CORRELATION
Body mass index (BMI)	0.80	0.40
General cognitive ability	0.86	0.60
Extraversion (EXT)	0.50	0.13
Dust allergy (ALL)	0.52	0.21

Basing your answers on these correlations and assuming the validity of twin study methods:

Which trait is the least influenced by non-shared environments?

Justify your answer.

Which trait is most influenced by the shared environment?

Justify your answer.

What is the narrow heritability of BMI?

Show how you arrived at this answer.

For which 2 traits might non-additive genetic influences (eg. dominance) be a factor?

Justify your answer.

Cross-breeding studies of animal behavior.

Two inbred strains of fruit flies (Drosophila melanogaster), P_1 and P_2, were crossed to give the F_1 generation. Flies from the F_1 were bred to give the F_2 generation. Male flies were placed with a standard "target" female and the amount of time spent in courtship was recorded. The sample sizes, mean courtship time observed for the 4 generations, and the variance for each generation are given below:

GENERATION	SAMPLE SIZE	MEAN COURTSHIP TIME (%)	VARIANCE IN COURTSHIP TIME
P_1	100	74.0	344
P_2	100	70.0	372
F_1	100	84.0	383
F_2	400	74.9	621

Do the generation means give evidence of genetic influences on courtship activity?

Justify your answer.

Do the generation variances give evidence of genetic influences on courtship activity?

Justify your answer.

Given that genes seem to be important in determining courtship time, what do the generation means tell you about the nature of that genetic control?