Comparative Neuroanatomy:
PreTest and PostTest (<mark>Key</mark>)

FORM

(F1) I am taking the following test:

(a) Comparative Neuroanatomy Pre-Test
(b) Comparative Neuroanatomy Post-Test

If you are taking the Comparative Neuroanatomy (CNA) Pre-Test, write the word "Pre" -OR- if you are taking the CNA Post-Test, enter the number of weeks since completing the module:

_____

DEMOGRAPHICS

(D1) Institution:

(a) UCLA
(b) non-UCLA

UCLA Student ID Number (no spaces) --OR-- Non-UCLA Student Institution Name:

_____

(D2) E-mail address (for tracking purposes and possibly ONE reminder; please use the e-mail address on file with your school for credit):

_____

(D3) Academic year:

(a) Freshman
(b) Sophmore
(c) Junior
(d) Senior
(e) other

(D4) Department/major in which the course was offered:

(a) Psychology department/major
(b) Biology department/major
(c) Neuroscience department/major
(d) other department/major

(D5) Department/major to which I belong:

_____

(D6) Grade expected to receive in the course:

    (a) A
    (b) B
    (c) C
    (d) D
    (e) F

(D7) Gender:

    (a) Male
    (b) Female

(D8) I would characterize myself as:

    (a) Asian
    (b) Black
    (c) Latino(a)
    (d) Native American
    (e) White
    (f) other

TEST

(T1) In statistics, what does R^2 signify?

    (a) the square of the correlation coefficient
    (b) the slope of the regression line
    (c) the proportion of variance in the Y variable predicted by the X variable
    (d) all of the above
    (e) only (a) and (c)

(T2) Which of the following are synonymous with the line that best describes the relationship between two variables?

    (a) the best fit line
    (b) the least squares line
    (c) the regression line
    (d) all of the above
    (e) only (b) and (c)

(T3) What does the regression line do?

    (a) It allows the best prediction of X given Y and a linear relationship between the variables.
    (b) It allows the best prediction of Y given X and a linear relationship between the variables.
    (c) It summarizes the relationship between Y and X with the least squared deviations in the Y variable.
    (d) both (a) and (c)
    (e) both (b) and (c)

(T4) Suppose we plotted brain size as a function of body size and then determined regression lines for primates separately from carnivores. Suppose also that the positive slope of the regression line for body size and brain size in carnivores was greater than the positive slope for these variables in primates. Which of the following statements would be true?

    (a) Carnivores and primates have about the same brain size when body size is equated.
    (b) Primates have bigger brains than carnivores for all body sizes.
    (c) With all other things being equal, carnivores have bigger brains than primates across body sizes.
    (d) Body size does not predict brain size.
    (e) Differences in brain size as a function of body size could only exist if one of the regression lines had a negative slope and one had a positive slope.

(5) Which of these is an evolutionary sequence?

    (a) goldfish, frog, lizard, chimpanzee, human
    (b) shark, turtle, chimpanzee, human
    (c) salamander, lizard, meerkat, human
    (d) goldfish, frog, lizard, meerkat, chimpanzee, human
    (e) none of the above

(6) What do outliers do? BAD QUESTION--EXCLUDED

    (a) They inflate the correlation coefficient but have no consistent impact on the regression line.
    (b) They decrease the correlation coefficient and decrease the slope of the regression line.
    (c) They increase both the correlation coefficient and the slope of the regression line.
    (d) They force the correlation coefficient and the slope of the regression line toward zero.
    (e) They change the sign of the correlation coefficient as well as the regression line.

(7) What does the hippocampus do?

    (a) stores long-term memories
    (b) stores long-term declarative memories but not procedural memories
    (c) consolidates declarative memory into long-term storage
    (d) stores a limited amount of information (7 plus/ minus 2 bits) in very short term memory
    (e) both (a) and (c)

(8) Suppose that two different subgroups had regression lines with radically different slopes, but we did not know this. If we put these two subgroups together and consider them as a whole, which of the following would be true? How would we expect the resultant relationship between the two variables to be changed? BAD QUESTION--EXCLUDED

    (a) The correlations would not be changed, but the regression lines would be changed.
    (b) The regression lines would be averaged, so there would an increase in the overall correlation coefficient relative to those found with the original subgroups.
    (c) The correlation coefficient would be forced to be closer to one and the slope of the regression line would also be forced toward 1.00.
    (d) The correlation coefficient would be closer to zero.
    (e) The slope of the regression line would be closer to zero.

(9) Suppose that we had a variable across species, such as body size, that was related to brain size but that we were not that interested in examining. How could we deal with this variable?

    (a) We could make it a predictor in a general linear model and remove this variable's influence.
    (b) We could only select individuals from each species that were matched in body weight.
    (c) We could randomize this variable so that its effect is not constant across species.
    (d) We could counterbalance for this variable so that its effect was not differential across species.
    (e) We could remove its influence via a carefully controlled experiment.

(10) Suppose that we tested many variables, including phylogenetic order, and found that body size was the only significant predictor of brain size across various species. Which of the following statements would be true?

    (a) Adding further predictors such as phylogenic order from which the brains came will account for more of the variance than body size alone.
    (b) We may conclude that there are genes that code for brain size that do not also affect body size.
    (c) Adding further predictors such as phylogenic order from which the brains came will NOT account for more of the variance than body size alone.
    (d) Adding further predictors such as phylogenic order will result in watering down the initial predictor so that it does not remain significant.
    (e) both (a) and (b)

(11) Suppose we removed the variance due to body size in our model, which was significantly correlated with our dependent measure, and then found that other brain measures of size were not significantly correlated with our dependent variable of interest. Which of the following statements would be true?

    (a) Brain size is the only variable that is predictive of the dependent variable.
    (b) This is a mistake, and we have made a Type II error.
    (c) There must be a high degree of intercorrelation among our other variables of interest.
    (d) The predictive validity of body size is lost.
    (e) both (b) and (d)

(12) What cell layers are present in the hippocampus?

    (a) Purkinje cells
    (b) Dentate gyrus
    (c) CA4
    (d) CA5
    (e) answers (b), (c), and (d)

(13) What is meant by mosaic evolution?

    (a) Evolution acts on the conglomeration of traits as a whole for individuals.
    (b) Evolution acts on different aspects of a phenotype simultaneously.
    (c) Evolution works on only one aspect of an organism's phenotype.
    (d) Evolution affects some body parts or systems without simultaneous changes in other parts.
    (e) Evolution only acts at the level of individuals, not species.

(14) What is an encephalization quotient?

    (a) a measure of brain size relative to body size
    (b) a measure of body size relative to brain size
    (c) the same as an intelligence quotient
    (d) an inverse allometric index
    (e) both (a) and (c)

(15) One species of birds which stores food for eating later also have large hippocampi relative to other bird species who don't store their food. What could you conclude?

    (a) This species has been selected to have larger hippocampi.
    (b) Storing requires spatial behavior, which in turn causes evolution to select for larger hippocampi.
    (c) Storing food causes the hippocampus to grow larger.
    (d) Remembering where the food is requires a larger hippocampus.
    (e) Any of the above are possible.

(16) Which animal is most intelligent?

    (a) Dog
    (b) Cat
    (c) Dolphin
    (d) Crow
    (e) This cannot be determined, because they have never been tested under identical circumstances/ conditions.

(17) Imagine that XYZ syndrome is a serious disease that affects 1 in 1000 people. Suppose that there is a test that always accurately identifies those afflicted with the disease. The test, however, also has a false positive rate of 5%, meaning that the test wrongly indicates that the XYZ virus is present in 5% of cases when the person does not have the virus. If a person chosen from the population at random tests positive for the XYZ virus, and nothing is known about their medical history, what is the probability that they may actually have the virus?

    (a) 0%
    (b) 0.1%
    (c) 2%
    (d) 5%
    (e) 95%

(18) Professor Y is trying to understand the brain origins of circling behavior in rats. In the first study, Professor Y stimulated brain region A and observed that 3 out of 10 rats ran in clockwise circles. In the second study, Professor Y stimulated brain region B and observed that 30 out of 100 rats ran in counterclockwise circles. If you repeated the two studies, again with 10 rats stimulated in region A and 100 rats stimulated in region B, which would be more likely to produce 50% circling in the expected region?

    (a) Region A is more likely to produce 50% clockwise circling (5 out of 10 rats).
    (b) Region B is more likely to produce 50% counterclockwise circling (50 out of 100 rats).
    (c) The two regions are equally likely to produce 50% circling in the expected direction.
    (d) This cannot be determined from the data.
    (e) The base rate of circling would need to be known in order to determine this.

(19) The symptoms of schizophrenia can often be alleviated by medications that block dopamine receptors in the brain. Using only this information, you can conclude that:

    (a) schizophrenia is directly caused by excess dopamine release.
    (b) schizophrenia is directly caused by excess dopamine receptors.
    (c) either (a) or (b)
    (d) both (a) and (b)
    (e) none of the above are necessary conclusions.

(20) A news report claims that about 1% of Americans are diagnosed as schizophrenic at some time in their lives. You know that Fred has been diagnosed schizophrenia. What is your estimate of the likelihood that Fred's neighbor, Marge, has been or will be diagnosed with schizophrenia?

    (a) greater than 1 in 100
    (b) less than 1 in 100
    (c) 1 in 100
    (d) no chance
    (e) cannot be determined

EVALUATION

(E1) The Comparative Neuroanatomy lab tutorial was clear and easy to follow.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E2) The Comparative Neuroanatomy lab tutorial was thorough and precise with its instructions.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E3) The ImageJ program was easy to use with guidance from the Comparative Neuroanatomy lab tutorial.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E4) I was satisfied with my ability to trace and select areas of interest using the ImageJ program in the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E5) I was satisfied with the accuracy of my measurements using the ImageJ program in the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E6) I felt comfortable about performing the ImageJ analysis in the Comparative Neuroanatomy module, because I knew that there was some room for error.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E7) I learned something about comparative neuroanatomy from the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E8) I understood the point of comparing various species brain structures in the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E9) I understood the purpose of the ImageJ program in the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E10) I learned something about the analytical features of the ImageJ program from the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E11) I learned something about the statistics from the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E12) I found it interesting to compare the brain structures of different mammals in the Comparative Neuroanatomy module.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E13) I feel that the Comparative Neuroanatomy module has helped me to think critically, especially when experiments did not go as planned.

    (a) strongly agree
    (b) agree
    (c) neither
    (d) disagree
    (e) strongly disagree

(E14) Please describe the purpose of the Comparative Neuroanatomy module from a learning standpoint in the space provided below.

END