

# Practice Quiz 9

Statistics 200

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1. (5 pts.) *Domestic goats follow gaze direction and use social cues in an object choice task*, published online in *Animal Behavior* in January of 2005, included information on goats' performance in a bucket-selection task. Based on the data obtained, we want to determine if a sample of 13 adult goats tended to be more successful in picking the bucket with food when cued by the experimenter pointing at it with a finger, compared to control conditions where no cue was given.

Point	13	10.923	2.691	0.746
Control	13	9.308	1.437	0.398
Difference	13	1.615	3.477	0.964

T-Test of mean difference = 0 (vs > 0): T-value = XXXXX P-Value = 0.060

- (a) The data arise from a (i) two-sample (ii) paired design.
- (b) The  $t$ -statistic has been X-ed out. Based on the size of the  $P$ -value, the  $t$ -statistic must be (i) large (ii) not large (iii) borderline
- (c) Are you convinced that in general goats respond to the pointing cue?  
(Answer yes or no or inconclusive.)
- (d) Based on your conclusion in (c), would a confidence interval for population mean of differences contain zero?  
(Answer yes or no or borderline.)
- (e) What would the  $P$ -value have been if a two-sided alternative had been used?
- (f) Would the sample difference have been more convincing if the sample size were much larger?

2. (5 pts.) *Domestic goats follow gaze direction and use social cues in an object choice task*, published online in *Animal Behavior* in January of 2005, included information on goats' performance in a bucket-selection task. Based on the data obtained, we want to determine if adult and juvenile goats may be equally successful in general when it comes to picking the bucket with food when cued by the experimenter pointing at it with a finger.

	N	Mean	StDev	SE Mean
Adults	13	10.92	2.69	0.75
Juveniles	10	12.10	2.38	0.75

Difference =  $\mu$  Adults -  $\mu$  Juveniles

Estimate for difference: -1.18

95% CI for difference: (-3.39, 1.03)

T-Test of difference = 0 (vs not =): T-Value = -1.11 P-Value = XXXXX DF = 20

- This was a (i) paired (ii) two-sample study.
- Does the confidence interval contain zero? (i) No, not even close. (ii) No, not quite. (iii) Yes, just barely. (iv) Yes, clearly.
- The test statistic is best described as (i) large (ii) not large (iii) borderline.
- The  $P$ -value has been X-ed out; based on the size of the test statistic, the  $P$ -value is best described as (i) small (ii) not small (iii) borderline.
- Is there compelling evidence of a difference in mean scores for all adult and juvenile goats performing this bucket selection task?