Data Analysis and Statistical Inference
Dr. Çetinkaya-Rundel
Duke University

In-Video Quiz Questions for Unit 4: Part 1 – (1) Hypothesis Testing for Paired Data

(01:20) – slide 3, after "Are the reading and writing scores of each student independent of each other?"

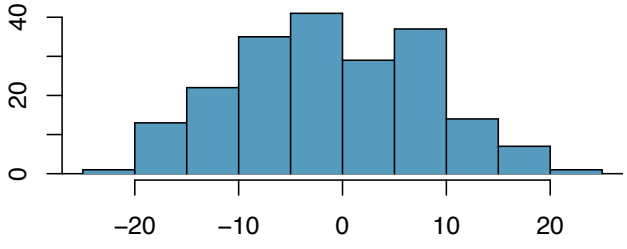
1. The same students took a reading and writing test and their scores are shown below. Are the reading and writing scores of each student independent of each other?

	ID	read	write
1	70	57	52
2	86	44	33
3	141	63	44
4	172	47	52
...	...	...	...
200	137	63	65

(a) Yes
(b) No

(05:01) – slide 9, after "And the test statistic is calculated based on sample statistics coming from the differences."

2. Which of the following is true about the conditions required to be met to proceed with this hypothesis test?



(a) The distribution of differences is bimodal, therefore we cannot continue with the hypothesis test.

(b) In order for differences to be random we should have sampled with replacement.
(c) Since students are sampled randomly and are less than 10% all students, we can assume that the sampling distribution of the average difference will be nearly normal.
(d) Since students are sampled randomly and are less than 10% of all high school students, we can assume that the difference between the reading and writing scores of one student in the sample is independent of another.

(07:14) – slide 11, after "We simply doubled one tail area to get to the p value."

3. At a 5% significance level, which of the following is the best conclusion of the hypothesis test?

(a) Fail to reject the null hypothesis, the data provide convincing evidence of a difference between the average reading and writing scores.

(b) Reject the null hypothesis, the data provide convincing evidence of a difference between the average reading and writing scores.

(c) Fail to reject the null hypothesis, the data do not provide convincing evidence of a difference between the average reading and writing scores.

(d) Reject the null hypothesis, the data do not provide convincing evidence of a difference between the average reading and writing scores.

Data Analysis and Statistical Inference
Dr. Çetinkaya-Rundel
Duke University

Answers:

1. b

Explanation: Since it's the same student taking the test, the scores for reading and writing are not independent.

2. d

Explanation: Random sample and 10% condition are about independence of observations, not about nearly normal sampling distribution.

3. c

Explanation: If p-value is high, fail to reject H_0, then no convincing evidence for the alternative.