"FRAPPY"

{Free Response AP Problem...Yay!}

The following problem is taken from an actual Advanced Placement Statistics Examination. Your task is to generate a complete, concise statistical response in 15 minutes. You will be graded based on the AP rubric and will earn a score of 0-4. After grading, keep this problem in your binder for your AP Exam preparation.

Sleep researchers know that some people are early birds (E), preferring to go to bed by 10 P.M. and arise by 7 A.M., while others are night owls (N), preferring to go to bed after 11 P.M. and arise after 8 A.M. A study was done to compare dream recall for early birds and night owls. One hundred people of each of the two types were selected at random and asked to record their dreams for one week. Some of the results are presented below.

	Number of Dreams Recalled During the Week			Proportion Who Recalled	
Group	Mean	Median	Standard Deviation	No dreams	5 or more dreams
Early birds	7.26	6.0	6.94	0.24	0.55
Night owls	9.55	9.5	5.88	0.11	0.69

Scoring:

(a) The researchers believe that night owls may have better dream recall than do early birds. One parameter of interest to the researchers is the mean number of dreams recalled per week with μ_E representing this mean for early birds and μ_N representing this mean for night owls. The appropriate hypotheses would then be $H_0 : \mu_E - \mu_N = 0$ and $H_A : \mu_E - \mu_N < 0$. State two other pairs of hypotheses that might be used to test the researchers' belief. Be sure to define the parameter of interest in each case.

E P I

(b) Use the data provided to carry out a test of the hypotheses about the mean number of dreams recalled per week given in the statement of part (a). Do the data support the researchers' belief?

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Total:__/4