

**Sample Test 2:
Inferential Statistics (t-tests, correlation, chi-square)**

Instructions: Analyze data for each and present APA styled results.

Note: This sample test focuses only upon the data analysis and presentation component; theoretical understanding (e.g., explain meaning of p-value; identify whether type 1 error occurred) is not illustrated among these sample items.

1. Health experts argue that the average caloric intake for adult males should be about 2,000 calories per day. Is there any evidence that the sample of male graduate students from GSU differ, on average, from this recommendation? Below is the daily caloric intake for a sample of GSU students.

2560, 3345, 5966, 1568, 3687, 2985, 2159, 2358, 4596, 4416

2. Do females in single-sex classes perform better than females in co-educational classes in high school biology? Below are end of course test scores in 9th grade biology for two classes, one taught with female-only and one with both males and females present.

Single-sex Class		Co-educational Class	
85	75	79	76
83	83	82	79
79	84	75	81
95	86	94	82
71	91	69	88
86	95	81	84
93	98	87	93

3. Self-determination theory is an explanation for motivation that contains three fundamental constructs: autonomy, relatedness, and competence. Briefly explained, autonomy refers to individual power and control over important decisions, relatedness is a want for interaction and social experience with others, and competence refers to one's ability to successfully interact with daily tasks and demands. Theory suggests these three variables should display positive associations. Below are data collected from a sample of psychology students in a freshmen introductory course to psychology – do the three variables display positive associations?

(Students ignore these notes in parentheses:

/start/

. matrix input Mean = (10.2,9.8,11.0)

. matrix input SD = (3.5, 4.1, 2.9)

. matrix input Corr = (1.00,.35,.46\ .35, 1, .53\ .46, .53, 1)

. corr2data autonomy relatedness competence, n(20) means(Mean) corr(Corr) sds(SD)

. correlate autonomy relatedness competence

/end/)

student	autonomy	relatedness	competence
1	5	5	8
2	11	12	12
3	16	12	14
4	11	12	11
5	7	13	14
6	13	17	12
7	9	10	11
8	6	6	7
9	9	14	9
10	13	8	8
11	14	10	14
12	6	12	8
13	12	11	16
14	11	17	16
15	12	4	12
16	6	3	12
17	14	10	12
18	6	5	5
19	16	8	9
20	8	7	10

4. Some college faculty believe that grade distributions should follow an approximate normal distribution. This is based upon the assumption that ability and effort will be normally distributed among college students. Sometimes faculty attempted to force a normal distribution in grades. Below are frequencies for grades in Calculus 1 at a local university for a large number of students. The grades provided contain only five categories (A, B, C, D, F), so a normal distribution would be impossible to model with only five categories. However, it is possible to determine whether these five categories provide frequencies that approximate a normal distribution. Percentages are presented that would approximate a normal distribution. Use these percentages to test whether the frequency of grades present appear to approximate a normal distribution.

Grade	Frequency	Percentage if Grades follow a Normal Distribution
A	93	6.5
B	156	25
C	112	37
D	63	25
F	33	6.5

5. Some students fail the high school graduation test and are targeted for summer training. These individuals were within a few points of passing with their first testing attempt. Below are their scores on the high school graduation test before summer training and after summer training. Is there any evidence that the summer training session enhanced test scores for these students?

Student	Before Summer Training	After Summer Training
1	783	794
2	775	786
3	791	786
4	795	802
5	786	792
6	793	799
7	783	786
8	791	803
9	795	804
10	796	799
11	785	790

6. Some students fail the high school graduation test and are targeted for summer training. These individuals were within a few points of passing with their first testing attempt. Below are performance data on second attempts to pass the high school graduation test after first failing the test. Two groups are presented: those who received summer training and those who did not receive summer training. Is there any evidence that summer training altered the passing rate for those who went to summer training?

	Pass	Fail
Attended Summer Training	113	233
Did Not Attend Summer Training	234	596