

Analysis of variance results

[Science](#), [Statistics](#)



Analysis of Variance Results

Table 4.

Analysis of Variance for ADD-like Behavior among Participants in the Remedial, General and College Preparatory English Levels.

SS

df

MS

F

d

Sig.

Between Groups

3476.35

2

1738.17

18.5

.72

< .001

Within Groups

20012.14

213

93.95

Total

23488.48

215

The research wanted to answer the question: “Is there a difference in the ADD-like symptoms among participants in the remedial, general, and college preparatory English levels?” In order to answer this question, the following research hypotheses were constructed:

H0: $\mu_{\text{remedial}} = \mu_{\text{general}} = \mu_{\text{collegeprep}}$

H1: The means are not all equal.

When considering the results for an Analysis of Variance, certain assumptions have to be met. First, the normality of the data set must be established. However, the ANOVA provides great leeway when this assumption is violated as long as such a violation is not too serious. Second, equality of variances must be assumed. In cases where variances of the groups are unequal, adjustments are made on the critical values of F and the degrees of freedom in order to accommodate the inequality. The third assumption is that the expected values of the errors are zero and, lastly, the errors must be independent.

Table 4 shows that the ANOVA results were statistically significant, $F(2, 213)$

= 18.5, $p < .001$. This indicates that the null hypothesis is to be rejected in favor of the alternative hypothesis, and that it may be concluded that there are differences in ADD-like symptoms among the three groups.

The strength of the relationship between English level and ADD-like behavior, as indexed by d was strong, with English level accounting for 72% of the variance in ADD-like behavior scores. A follow up Tukey test was performed to examine pair-wise differences because equal variances can be assumed. Findings indicate that those from the college preparatory group ($M = 43.07$, $SD = 7.8$) reported a significantly lower level of ADD like behavior compared with those from the general group ($M = 53.81$, $SD = 9.5$) and the remedial group ($M = 56.97$, $SD = 11.7$). There was no significant difference in the ADD-like behavior scores between the general group and the remedial group. Therefore, results from the ANOVA test found that participants enrolled in the college preparatory English level differed significantly on ADD-like behavior scores compared to both general English level and remedial English level participants, and that the difference between the groups was large, with college preparatory participants reporting lower ADD-like tendencies than the two other groups.

Oneway

Notes

Output Created

05-Nov-2011 13: 56: 58

Comments

Input

Data

C: Users\User\Documents\AROct30 ADHD t test\Howell_dataset_cleaned.sav

Active Dataset

DataSet1

Filter

Weight

Split File

N of Rows in Working Data File

216

Missing Value Handling

Definition of Missing

User-defined missing values are treated as missing.

Cases Used

Statistics for each analysis are based on cases with no missing data for any variable in the analysis.

Syntax

```
ONEWAY ADDSC BY ENGL  
/MISSING ANALYSIS  
/POSTHOC= TUKEY ALPHA(0. 05).
```

Resources

Processor Time

00: 00: 00. 078

Elapsed Time

00: 00: 00. 214

[DataSet1] C: Users\User\Documents\AROct30 ADHD t
testHowell_dataset_cleaned. sav

ANOVA

ADD-like behavior score (mean of 3)

Sum of Squares

df

Mean Square

F

Sig.

Between Groups

3476.346

2

1738.173

18.500

.000

Within Groups

20012.136

213

93.954

Total

23488.481

215

Post Hoc Tests

Multiple Comparisons

ADD-like behavior score (mean of 3)

Tukey HSD

(I) 9th Grade English Level

(J) 9th Grade English Level

Mean Difference (I-J)

Std. Error

Sig.

dimension2

College Prep

dimension3

General

-10.73623*

1.96211

.000

Remedial

-13.90578*

2.46716

.000

General

dimension3

College Prep

10. 73623*

1. 96211

. 000

Remedial

-3. 16955

1. 85935

. 206

Remedial

dimension3

College Prep

13. 90578*

2. 46716

. 000

General

3. 16955

1. 85935

. 206

*. The mean difference is significant at the 0. 05 level.

Multiple Comparisons

ADD-like behavior score (mean of 3)

Tukey HSD

(I) 9th Grade English Level

(J) 9th Grade English Level

95% Confidence Interval

Lower Bound

Upper Bound

dimension2

College Prep

dimension3

General

-15.3672

-6.1052

Remedial

-19.7288

-8.0828

General

dimension3

College Prep

6. 1052

15. 3672

Remedial

-7. 5580

1. 2189

Remedial

dimension3

College Prep

8. 0828

19. 7288

General

-1. 2189

7. 5580

Homogeneous Subsets

ADD-like behavior score (mean of 3)

Tukey HSDa, b

9th Grade English Level

N

Subset for alpha = 0.05

1

2

dimension1

College Prep

29

43.0690

General

154

53.8052

Remedial

33

56.9747

Sig.

1.000

.293

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 42.088.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.