Counselor Problem

a.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Younger | Same | Older |  | Approach | Ratings1 | Age |
| Directive | 22 | 25 | 33 |  | Directive | 22 | Younger |
| Directive | 28 | 31 | 30 |  | Directive | 28 | Younger |
| Directive | 24 | 23 | 35 |  | Directive | 24 | Younger |
| Directive | 30 | 28 | 28 |  | Directive | 30 | Younger |
| Directive | 25 | 22 | 34 |  | Directive | 25 | Younger |
| Directive | 27 | 24 | 32 |  | Directive | 27 | Younger |
| Non | 36 | 29 | 24 |  | Nondirective | 36 | Younger |
| Non | 34 | 32 | 28 |  | Nondirective | 34 | Younger |
| Non | 29 | 26 | 23 |  | Nondirective | 29 | Younger |
| Non | 31 | 31 | 27 |  | Nondirective | 31 | Younger |
| Non | 35 | 25 | 21 |  | Nondirective | 35 | Younger |
| Non | 32 | 28 | 25 |  | Nondirective | 32 | Younger |
| Combined | 35 | 36 | 33 |  | Combined | 35 | Younger |
| Combined | 29 | 35 | 30 |  | Combined | 29 | Younger |
| Combined | 32 | 38 | 32 |  | Combined | 32 | Younger |
| Combined | 30 | 32 | 34 |  | Combined | 30 | Younger |
| Combined | 34 | 34 | 28 |  | Combined | 34 | Younger |
| Combined | 28 | 36 | 36 |  | Combined | 28 | Younger |
|  |  |  |  |  | Directive | 25 | Same |
|  |  |  |  |  | Directive | 31 | Same |
|  |  |  |  |  | Directive | 23 | Same |
|  |  |  |  |  | Directive | 28 | Same |
|  |  |  |  |  | Directive | 22 | Same |
|  |  |  |  |  | Directive | 24 | Same |
|  |  |  |  |  | Nondirective | 29 | Same |
|  |  |  |  |  | Nondirective | 32 | Same |
|  |  |  |  |  | Nondirective | 26 | Same |
|  |  |  |  |  | Nondirective | 31 | Same |
|  |  |  |  |  | Nondirective | 25 | Same |
|  |  |  |  |  | Nondirective | 28 | Same |
|  |  |  |  |  | Combined | 36 | Same |
|  |  |  |  |  | Combined | 35 | Same |
|  |  |  |  |  | Combined | 38 | Same |
|  |  |  |  |  | Combined | 32 | Same |
|  |  |  |  |  | Combined | 34 | Same |
|  |  |  |  |  | Combined | 36 | Same |
|  |  |  |  |  | Directive | 33 | Older |
|  |  |  |  |  | Directive | 30 | Older |
|  |  |  |  |  | Directive | 35 | Older |
|  |  |  |  |  | Directive | 28 | Older |
|  |  |  |  |  | Directive | 34 | Older |
|  |  |  |  |  | Directive | 32 | Older |
|  |  |  |  |  | Nondirective | 24 | Older |
|  |  |  |  |  | Nondirective | 28 | Older |
|  |  |  |  |  | Nondirective | 23 | Older |
|  |  |  |  |  | Nondirective | 27 | Older |
|  |  |  |  |  | Nondirective | 21 | Older |
|  |  |  |  |  | Nondirective | 25 | Older |
|  |  |  |  |  | Combined | 33 | Older |
|  |  |  |  |  | Combined | 30 | Older |
|  |  |  |  |  | Combined | 32 | Older |
|  |  |  |  |  | Combined | 34 | Older |
|  |  |  |  |  | Combined | 28 | Older |
|  |  |  |  |  | Combined | 36 | Older |

b. Ho1: µy = µs = µa

Ha1: Not all means are equal

Ho2: µd = µn = µc

Ha2: Not all means are equal

Ho3: No interaction

Ha3: Interaction

c.

Source DF Seq SS Adj SS Adj MS F P

Approach 2 264.481 264.481 132.241 17.49 0.000

Age 2 1.926 1.926 0.963 0.13 0.881

Approach\*Age 4 404.185 404.185 101.046 13.37 0.000

Error 45 340.167 340.167 7.559

Total 53 1010.759

d.



e. It does not look like Age has much effect on the rating by looking at the main effect plot. The means do not jump or change much. Although the approach looks like it does have an effect on the rating as it has big jumps from means.

f.



g.



Population sample is Random as shown by the versus order plot

Approximately normal as shown by the NPP

Approximately equal variances as shown by the versus fits plot

h. We have significant evidence to reject our 2nd null hypothesis with a p-value of .0000, but not significant evidence to reject our 1st null hypothesis with a p-value of .881. So there is a difference in means for the approach, and not a significant difference in means for age.

Approach N Mean Grouping

Combined 18 32.9 A

Nondirective 18 28.7 B

Directive 18 27.8 B

From our tukey test, the combined approach’s mean is significantly different from the nondirective and directive means.

So the most effective approach is Combined for all age groups due to its mean being significantly higher than Nondirective and Directive, and age having no significant effect.

We also reject our 3rd null hypothesis due to a low p-value of .0000, so there is an interaction with age and approach.