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Quantitative Method

April 16, 2014

**SPSS Project**

1. H0: IV’s had no effect on DV
   * Washing of feet will have no effect on the rate of stinkiness
   * Using baby powder will have no effect on the rate of stinkiness

* Interaction: The difference in means of washing your feet do not depend on the performance of using baby powder
* Main effect 1: do washing your feet affect foot stinkiness
* Main effect 2: does using baby powder affect foot stinkiness

1. Ha: IV’s had an effect on DV
   * Washing of feet will have an effect on the rate of stinkiness
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* Interaction: The difference in means of washing your feet do depend on the performance of using baby powder
* Main effect 1: do washing your feet affect foot stinkiness
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1. The alpha level I will use to test my data is 0.5; I chose this level because it reduces Type I Error and you will find a more significant difference within your data.
2. I will perform a 2-tailed test because the experiment is not directional; we are not looking at whether either independent variable increases or decreases your foot stinkiness, but what causes feet to get stinky.
3. Independent Variables:
   * IV 1(first manipulation): Washing your feet
     + Levels: yes or no
   * IV2(second manipulation): Using baby powder on feet
     + Levels: yes or no
4. The operational definition of my dependent variable is the use of ratings 1-10
   * 1 = yummy and 10 = reeks
5. The statistical test I will perform on my data is a two-way Analysis of Variance (ANOVA); I chose this type of analysis because I have two independent variables with two levels each. Both independent variables are between-groups design.
6. View data sheet attached
7. View outlook attached
8. Posthocs are not necessary
9. Decisions with respect to the null hypotheses:
   * IV 1: reject the null hypothesis
     + *F* (1, 34) = 57.493, *p* < 0.001, n2 = 0.628
     + .05>.001; alpha level is larger so we reject
   * IV 2: reject the null hypothesis
     + *F* (1, 34) = 8.445, *p* = 0.006, n2 = 0.199
     + .05>.006; alpha level is larger so we reject
   * Interaction: reject the null hypothesis
     + *F* (1, 34) = 5.736, *p* = 0.022, n2 = 0.144
     + .05>.022; alpha level is larger so we reject
10. Results section

**2 Way ANOVA: Use of Baby Powder and Washing of Feet Determining Stinkiness**

| **Between-Subjects Factors** | | | |
| --- | --- | --- | --- |
|  | | Value Label | N |
| washingfeet | 1 | yes | 20 |
| 2 | no | 18 |
| usingpowder | 1 | yes | 19 |
| 2 | no | 19 |

| **Descriptive Statistics** | | | | |
| --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | |
| washingfeet | usingpowder | Mean | Std. Deviation | N |
| yes | yes | 2.40 | 2.011 | 10 |
| no | 2.70 | 2.003 | 10 |
| Total | 2.55 | 1.959 | 20 |
| no | yes | 5.44 | 1.740 | 9 |
| no | 8.56 | 1.333 | 9 |
| Total | 7.00 | 2.196 | 18 |
| Total | yes | 3.84 | 2.410 | 19 |
| no | 5.47 | 3.438 | 19 |
| Total | 4.66 | 3.043 | 38 |

| **Tests of Between-Subjects Effects** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | | | |
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
| Corrected Model | 231.608a | 3 | 77.203 | 23.660 | .000 | .676 |
| Intercept | 864.024 | 1 | 864.024 | 264.788 | .000 | .886 |
| washingfeet | 187.603 | 1 | 187.603 | 57.493 | .000 | .628 |
| usingpowder | 27.558 | 1 | 27.558 | 8.445 | .006 | .199 |
| washingfeet \* usingpowder | 18.716 | 1 | 18.716 | 5.736 | .022 | .144 |
| Error | 110.944 | 34 | 3.263 |  |  |  |
| Total | 1167.000 | 38 |  |  |  |  |
| Corrected Total | 342.553 | 37 |  |  |  |  |
| a. R Squared = .676 (Adjusted R Squared = .648) | | | | | | |

**Estimated Marginal Means**

**1. washingfeet**

| **Estimates** | | | | |
| --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | |
| washingfeet | Mean | Std. Error | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| yes | 2.550 | .404 | 1.729 | 3.371 |
| no | 7.000 | .426 | 6.135 | 7.865 |

| **Pairwise Comparisons** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | | | |
| (I) washingfeet | (J) washingfeet | Mean Difference (I-J) | Std. Error | Sig.a | 95% Confidence Interval for Differencea | |
| Lower Bound | Upper Bound |
| yes | no | -4.450\* | .587 | .000 | -5.643 | -3.257 |
| no | yes | 4.450\* | .587 | .000 | 3.257 | 5.643 |
| Based on estimated marginal means | | | | | | |
| \*. The mean difference is significant at the .05 level.  a. Adjustment for multiple comparisons: Bonferroni. | | | | | | |

| **Univariate Tests** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | | | |
|  | Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
| Contrast | 187.603 | 1 | 187.603 | 57.493 | .000 | .628 |
| Error | 110.944 | 34 | 3.263 |  |  |  |
| The F tests the effect of washingfeet. This test is based on the linearly independent pairwise comparisons among the estimated marginal means. | | | | | | |

**2. usingpowder**

| **Estimates** | | | | |
| --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | |
| usingpowder | Mean | Std. Error | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| yes | 3.922 | .415 | 3.079 | 4.766 |
| no | 5.628 | .415 | 4.784 | 6.471 |

| **Pairwise Comparisons** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | | | |
| (I) usingpowder | (J) usingpowder | Mean Difference (I-J) | Std. Error | Sig.a | 95% Confidence Interval for Differencea | |
| Lower Bound | Upper Bound |
| yes | no | -1.706\* | .587 | .006 | -2.898 | -.513 |
| no | yes | 1.706\* | .587 | .006 | .513 | 2.898 |
| Based on estimated marginal means | | | | | | |
| \*. The mean difference is significant at the .05 level.  a. Adjustment for multiple comparisons: Bonferroni. | | | | | | |

| **Univariate Tests** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | | | |
|  | Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
| Contrast | 27.558 | 1 | 27.558 | 8.445 | .006 | .199 |
| Error | 110.944 | 34 | 3.263 |  |  |  |
| The F tests the effect of usingpowder. This test is based on the linearly independent pairwise comparisons among the estimated marginal means. | | | | | | |

| **3. washingfeet \* usingpowder** | | | | | |
| --- | --- | --- | --- | --- | --- |
| Dependent Variable:stinkiness | | | | | |
| washingfeet | usingpowder | Mean | Std. Error | 95% Confidence Interval | |
| Lower Bound | Upper Bound |
| yes | yes | 2.400 | .571 | 1.239 | 3.561 |
| no | 2.700 | .571 | 1.539 | 3.861 |
| no | yes | 5.444 | .602 | 4.221 | 6.668 |
| no | 8.556 | .602 | 7.332 | 9.779 |