Marie Wallmark

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2016-0509 MSDS 6371

Live Session Assignment4

1. Is at least one of the five population distributions (by education level) different from the others (in income)?
2. Survey data were collected by the Nat’l Longitudinal Survey of Youth in 1979; education and income information were collected from same individuals in 2005. Sample is random, with no controls in place. As such, educational level as independent variable is a post hoc characterization, not an experimental condition. Sample size (2,584) is adequate.
3. Descriptives:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **Education** | | | | | |
|  | N | Mean | Std. Deviation | Std. Error |
|
| <12 | 136 | 28301.45 | 21021.897 | 1802.613 |
| 12 | 1020 | 36864.90 | 29369.730 | 919.602 |
| 13-15 | 648 | 44875.96 | 33913.536 | 1332.250 |
| 16 | 406 | 69996.97 | 64256.802 | 3189.012 |
| >16 | 374 | 76855.46 | 65428.293 | 3383.216 |
| Total | 2584 | 49417.00 | 46727.925 | 919.243 |

1. Results of ANOVA:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| Income | | | | | |
|  | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 688235137515.904 | 4 | 172058784378.976 | 89.613 | .000 |
| Within Groups | 4951742721103.092 | 2579 | 1920024319.931 |  |  |
| Total | 5639977858618.996 | 2583 |  |  |  |

Effect size was large (η2 = 5.612), as was *F*(*df* = 4), *p* < .0001.

1. Tukey’s HSD revealed insignificance in income differences between the >12 and and 12 groups (*p* = .203), and between 16 and >16 (*p* = .168). All other pair-wise comparisons of means were significant.
2. Residuals diagnostic was conducted examining standardized and unstandardized residuals.
3. It seems clear from this analysis that educational level is strongly correlated with income. The largest difference in income is between the 13-15 and the 16 years levels: >16 exceeds 16 by $6,858 (μ5 – μ4); 16 exceeds 13-15 by $25,121(μ4 – μ3); 13-15 exceeds 12 by $8,011 (μ3 – μ2); and 12 exceeds <12 by $8,563 (μ2 – μ1). This indicates that obtaining a Bachelor’s degree (as opposed to “some college completed”) is correlated strongly with a substantial increase in income.