HPESS Survey Statistics on Factor Analysis Produced Variables

- Question – For each of the factor variables (knowledge, participation), is there a difference in the average response by age?

  Answer – NO, not for either variable

- Question – For each of the factor variables (knowledge, participation), is there a difference in the average response by gender?

  Answer – NO, not for either variable

- Question – For each of the factor variables (knowledge, participation), is there a difference in the average response by level of education

  Answer – NO, not for either variable

- Question: For each of the factor variables (knowledge, participation), is there a difference in the average response based upon racer or ethnicity

  Answer – K-Wallis (nonparametric ANOVA reports a significant p value for "knowledge" but the Dunn test finds no significant difference among the pairs tested. No significant difference was found for "participate"

- Question – For each of the factor variables (knowledge, participation), is there a difference in the average response by age?

```
. dunntest iknowledge, by(iage) ma(bh) wrap

Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs | Rank Sum |
  |------+-----+----------|
  |    1 |   1 |     3.50 |
  |    2 |  22 |   876.00 |
  |    3 |  35 |  1415.50 |
  |    4 |  11 |   324.50 |
  |    5 |   5 |   209.50 |
  |------+-----+----------|
  |    6 |   1 |    21.00 |
  +------------------------+

chi-squared =     5.540 with 5 d.f.
probability =     0.3535

chi-squared with ties =     7.568 with 5 d.f.
probability =     0.1817


              Dunn's Pairwise Comparison of iknowledge by iage
                            (Benjamini-Hochberg)
Col Mean-|
Row Mean |             1             2             3             4             5
---------+-----------------------------------------------------------------------
       2 |  -1.904824
         |     0.2130
         |
       3 |  -1.953424  -0.123125
         |     0.3808     0.4510
         |
       4 |  -1.334942   1.498433   1.697718
```

```
          |     0.2274     0.2010     0.1679
          |
        5 |  -1.879853  -0.225341  -0.163446  -1.232896
          |     0.1503     0.4741     0.4662     0.2332
          |
        6 |  -0.663600   0.986980   1.028078   0.436423   1.023149
          |     0.3456     0.2427     0.2849     0.4141     0.2552

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iparticipate, by(iage) ma(bh) wrap

Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs | Rank Sum |
  |------+-----+----------|
  |    1 |   1 |    10.00 |
  |    2 |  22 |   810.00 |
  |    3 |  35 |  1355.00 |
  |    4 |  11 |   407.50 |
  |    5 |   5 |   221.50 |
  |------+-----+----------|
  |    6 |   1 |    46.00 |
  +------------------------+

chi-squared =     2.326 with 5 d.f.
probability =     0.8024

chi-squared with ties =     2.448 with 5 d.f.
probability =     0.7843


             Dunn's Pairwise Comparison of iparticipate by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             1             2             3             4             5
---------+-----------------------------------------------------------------------
       2 |  -1.234590
         |     0.5425
         |
       3 |  -1.332682  -0.328032
         |     0.6849     0.4643
         |
       4 |  -1.218838  -0.028970   0.227253
         |     0.4179     0.4884     0.4732
         |
       5 |  -1.473837  -0.710833  -0.549938  -0.633107
         |     1.0000     0.5965     0.5460     0.5643
         |
       6 |  -1.198211  -0.422690  -0.338143  -0.403548  -0.073047
         |     0.3463     0.5604     0.5013     0.5149     0.5045

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
```

Question – For each of the factor variables (knowledge, participation), is there a difference in the average response by gender?

```
. ranksum iknowledge, by(igender)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

     igender |      obs    rank sum    expected
-------------+---------------------------------
           1 |       17         579         646
           2 |       58        2271        2204
-------------+---------------------------------
    combined |       75        2850        2850

unadjusted variance     6244.67
adjustment for ties    -1673.27
                     ----------
adjusted variance       4571.40
```

```
Ho: iknowl~e(igender==1) = iknowl~e(igender==2)
              z =  -0.991
    Prob > |z| =   0.3217

.
. ranksum iparticipate, by(igender)

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

     igender |      obs    rank sum    expected
-------------+---------------------------------
           1 |       17       599.5         646
           2 |       58      2250.5        2204
-------------+---------------------------------
    combined |       75        2850        2850

unadjusted variance     6244.67
adjustment for ties     -310.99
                        ----------
adjusted variance       5933.68

Ho: iparti~e(igender==1) = iparti~e(igender==2)
              z =  -0.604
    Prob > |z| =   0.5461
```

- Question – For each of the factor variables (knowledge, participation), is there a difference in the average response by level of education

```
. dunntest iknowledge, by(ied) ma(bh) wrap

Kruskal-Wallis equality-of-populations rank test

  +----------------------+
  | ied | Obs | Rank Sum |
  |-----+-----+----------|
  |   1 |  26 |   952.00 |
  |   2 |  48 |  1894.50 |
  |   3 |   1 |     3.50 |
  +----------------------+

chi-squared =     2.829 with 2 d.f.
probability =     0.2431

chi-squared with ties =     3.864 with 2 d.f.
probability =     0.1449


             Dunn's Pairwise Comparison of iknowledge by ied
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             1             2
---------+----------------------
       2 |  -0.628394
         |     0.2649
         |
       3 |   1.742681   1.909111
         |     0.0610     0.0844

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iparticipate, by(ied) ma(bh) wrap

Kruskal-Wallis equality-of-populations rank test

  +----------------------+
  | ied | Obs | Rank Sum |
  |-----+-----+----------|
  |   1 |  26 |  1051.50 |
  |   2 |  48 |  1784.00 |
  |   3 |   1 |    14.50 |
  +----------------------+
```

```
chi-squared =     1.559 with 2 d.f.
probability =     0.4586

chi-squared with ties =     1.641 with 2 d.f.
probability =     0.4402


             Dunn's Pairwise Comparison of iparticipate by ied
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             1             2
---------+----------------------
       2 |   0.633189
         |     0.2633
         |
       3 |   1.198283   1.055981
         |     0.3462     0.2182

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
```

- Question: For each of the factor variables (knowledge, participation), is there a difference in the average response based upon racer or ethnicity

```
. dunntest iknowledge, by(ieth) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | ieth | Obs | Rank Sum |
  |------+-----+----------|
  |    1 |  38 |  1601.50 |
  |    2 |  12 |   333.00 |
  |    3 |  20 |   759.00 |
  |    4 |   3 |    53.50 |
  |    7 |   2 |   103.00 |
  +------------------------+

chi-squared =     7.365 with 4 d.f.
probability =     0.1178

chi-squared with ties =    10.060 with 4 d.f.
probability =     0.0394


              Dunn's Pairwise Comparison of iknowledge by ieth
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             1             2             3             4
---------+--------------------------------------------
       2 |   2.331226
         |     0.0987
         |
       3 |   0.814293  -1.498008
         |     0.2308     0.1118
         |
       4 |   2.173971   0.823862   1.742413
         |     0.0743     0.2563     0.1018
         |
       7 |  -0.691538  -1.667587  -0.979809  -1.977762
         |     0.2446     0.0954     0.2337     0.0799

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iparticipate, by(ieth) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test
```

```
  +-----------------------+
  | ieth | Obs | Rank Sum |
  |------+-----+----------|
  |    1 |  38 |  1430.50 |
  |    2 |  12 |   507.00 |
  |    3 |  20 |   659.50 |
  |    4 |   3 |   128.00 |
  |    7 |   2 |   125.00 |
  +-----------------------+

chi-squared =     4.195 with 4 d.f.
probability =     0.3803

chi-squared with ties =     4.414 with 4 d.f.
probability =     0.3528


             Dunn's Pairwise Comparison of iparticipate by ieth
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             1             2             3             4
---------+--------------------------------------------
       2 |  -0.654633
         |     0.3204
         |
       3 |   0.795667   1.195612
         |     0.3552     0.2898
         |
       4 |  -0.394164  -0.030384  -0.736811
         |     0.3853     0.4879     0.3295
         |
       7 |  -1.612653  -1.247994  -1.873935  -1.022662
         |     0.2670     0.3534     0.3047     0.3065

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
```