

MM-SR Statistical Analysis

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8/29/2021

Introduction To This Document

Below you will find multiple chi-square, two-proportion tests to statistically analyze differences between mixed methods, educational, IES funded studies and non-IES funded published journal articles. This document is divided into two sections: one that analyzes qualitative analyses information and one that analyzes quantitative analyses information from our documents. Both sections involve a significance table at the end of each section to condense findings into one easily readable space. The proportion test we used derived from the `{stats}` package.

- `prop.test()` is a function that tests the proportions of “successes” of two categorical groups
- at minimum, it requires two things within function: `x` and `n`
- `x` vector is the observed values; `c()` indicates a list of values
- `n` vector is sample size of both groups; `c()` indicates a list of values
- the first values from `x = c(x, y)` corresponds to the first value of `n = c(z, w)`, so that a count of `x` is associated with a sample size of `z`, and a count of `y` is associated with a sample size of `w`.
- a two-sided alternative hypothesis was used, as we did not commit to a prior hypothesis.
- `conf.level = 0.95` indicates that a 95% confidence level was set for the confidence intervals
- `correct = FALSE` was used, as the Yates continuity correction was not implemented
- more info and documentation about `prop.test()` and its components can be found via “`?prop.test`” without the quotation marks

Qualitative Data Analysis Method

Journal Articles vs. IES Funded Study Reporting

Was there a significant difference in the frequency that a qualitative data analysis method was reported when comparing these two groups?

```
prop.test(x = c(234, 39), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
```

```
## 2-sample test for equality of proportions without continuity
```

```
## correction
##
## data: c(234, 39) out of c(255, 295)
## X-squared = 337.53, df = 1, p-value < 2.2e-16
## alternative hypothesis: two.sided
## 95 percent confidence interval:
## 0.7341369 0.8367505
## sample estimates:
## prop 1 prop 2
## 0.9176471 0.1322034
```

Journal Articles Level 1 vs. IES Funded Study Level 1

Was there a significant difference in the frequency that a qualitative data analysis method of complexity level 1 was reported when comparing these two groups?

```
prop.test(x = c(54, 4), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data: c(54, 4) out of c(255, 295)
## X-squared = 56.959, df = 1, p-value = 4.45e-14
## alternative hypothesis: two.sided
## 95 percent confidence interval:
## 0.1463522 0.2500586
## sample estimates:
## prop 1 prop 2
## 0.21176471 0.01355932
```

Journal Articles Level 2 vs. IES Funded Study Level 2

Was there a significant difference in the frequency that a qualitative data analysis method of complexity level 2 was reported when comparing these two groups?

```
prop.test(x = c(131, 25), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data: c(131, 25) out of c(255, 295)
## X-squared = 123.87, df = 1, p-value < 2.2e-16
```

```
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.3598905 0.4980690
## sample estimates:
##      prop 1      prop 2
## 0.51372549 0.08474576
```

Journal Articles Level 3 vs. IES Funded Study Level 3

Was there a significant difference in the frequency that a qualitative data analysis method of complexity level 3 was reported when comparing these two groups?

```
prop.test(x = c(162, 15), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(162, 15) out of c(255, 295)
## X-squared = 214.06, df = 1, p-value < 2.2e-16
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.5202684 0.6486249
## sample estimates:
##      prop 1      prop 2
## 0.63529412 0.05084746
```

Findings

Figure 1. Significance Table

Chi-Square Two-Proportion Test	Results
Reporting of a Qualitative Analysis Method	Statistically significant difference ($\chi^2 = 337.53$, $p < 0.05$) where journal articles reported the use of a qualitative data analysis method significantly more than IES funded studies.
Utilized Qualitative Analysis Method of Complexity Level 1	Statistically significant difference ($\chi^2 = 56.96$, $p < 0.05$) where journal articles reported using a qualitative data analysis method of complexity level 1 significantly more than IES funded studies.

Chi-Square Two-Proportion Test	Results
Utilized Qualitative Analysis Method of Complexity Level 2	Statistically significant difference ($\chi^2 = 123.87$ $p < 0.05$) where journal articles reported using a qualitative data analysis method of complexity level 2 significantly more than IES funded studies.
Utilized Qualitative Analysis Method of Complexity Level 3	Statistically significant difference ($\chi^2 = 214.06$, $p < 0.05$) where journal articles reported using a qualitative data analysis method of complexity level 3 significantly more than IES funded studies.

Quantitative Data Analysis Method

Journal Articles vs. IES Funded Study Reporting

Was there a significant difference in the frequency that a quantitative data analysis method was reported when comparing these two groups?

```
prop.test(x = c(255, 295), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
## Warning in prop.test(x = c(255, 295), n = c(255, 295), alternative =
## "two.sided", : Chi-squared approximation may be incorrect
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data: c(255, 295) out of c(255, 295)
## X-squared = NaN, df = 1, p-value = NA
## alternative hypothesis: two.sided
## 95 percent confidence interval:
## 0 0
## sample estimates:
## prop 1 prop 2
##      1      1
```

Journal Articles Level 1 vs. IES Funded Study Level 1

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 1 was reported when comparing these two groups?

```
prop.test(x = c(154, 59), n = c(255, 295), alternative = "two.sided",
         conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(154, 59) out of c(255, 295)
## X-squared = 94.039, df = 1, p-value < 2.2e-16
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.3285097 0.4793334
## sample estimates:
##      prop 1      prop 2
## 0.6039216 0.2000000
```

Journal Articles Level 2 vs. IES Funded Study Level 2

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 2 was reported when comparing these two groups?

```
prop.test(x = c(172, 56), n = c(255, 295), alternative = "two.sided",
         conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(172, 56) out of c(255, 295)
## X-squared = 132.39, df = 1, p-value < 2.2e-16
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.4118091 0.5575495
## sample estimates:
##      prop 1      prop 2
## 0.6745098 0.1898305
```

Journal Articles Level 3 vs. IES Funded Study Level 3

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 3 was reported when comparing these two groups?

```
prop.test(x = c(56, 93), n = c(255, 295), alternative = "two.sided",
         conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(56, 93) out of c(255, 295)
## X-squared = 6.3348, df = 1, p-value = 0.01184
## alternative hypothesis: two.sided
## 95 percent confidence interval:
## -0.16908200 -0.02221079
## sample estimates:
##      prop 1      prop 2
## 0.2196078 0.3152542
```

Journal Articles Level 4 vs. IES Funded Study Level 4

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 4 was reported when comparing these two groups?

```
prop.test(x = c(4, 6), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
## Warning in prop.test(x = c(4, 6), n = c(255, 295), alternative = "two.sided", :
## Chi-squared approximation may be incorrect
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(4, 6) out of c(255, 295)
## X-squared = 0.16586, df = 1, p-value = 0.6838
## alternative hypothesis: two.sided
## 95 percent confidence interval:
## -0.02683525 0.01752983
## sample estimates:
##      prop 1      prop 2
## 0.01568627 0.02033898
```

Journal Articles Level 5 vs. IES Funded Study Level 5

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 5 was reported when comparing these two groups?

```
prop.test(x = c(61, 48), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(61, 48) out of c(255, 295)
## X-squared = 5.0376, df = 1, p-value = 0.0248
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.009305014 0.143702629
## sample estimates:
##      prop 1      prop 2
## 0.2392157 0.1627119
```

Journal Articles Level 6 vs. IES Funded Study Level 6

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 6 was reported when comparing these two groups?

```
prop.test(x = c(17, 66), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(17, 66) out of c(255, 295)
## X-squared = 26.331, df = 1, p-value = 2.876e-07
## alternative hypothesis: two.sided
## 95 percent confidence interval:
## -0.2136211 -0.1005032
## sample estimates:
##      prop 1      prop 2
## 0.06666667 0.22372881
```

Journal Articles Level 7 vs. IES Funded Study Level 7

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 7 was reported when comparing these two groups?

```
prop.test(x = c(11, 199), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
```

```
## data:  c(11, 199) out of c(255, 295)
## X-squared = 231.04, df = 1, p-value < 2.2e-16
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  -0.6904341 -0.5724440
## sample estimates:
##      prop 1      prop 2
## 0.04313725 0.67457627
```

Journal Articles Level 8 vs. IES Funded Study Level 8

Was there a significant difference in the frequency that a quantitative data analysis method of complexity level 8 was reported when comparing these two groups?

```
prop.test(x = c(0, 30), n = c(255, 295), alternative = "two.sided",
          conf.level = 0.95, correct = FALSE)
```

```
##
## 2-sample test for equality of proportions without continuity
## correction
##
## data:  c(0, 30) out of c(255, 295)
## X-squared = 27.428, df = 1, p-value = 1.63e-07
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  -0.13618535 -0.06720448
## sample estimates:
##      prop 1      prop 2
## 0.00000000 0.1016949
```

Findings

Figure 2. Significance Table

Chi-Square Two-Proportion Test	Results
Reporting of a Quantitative Analysis Method	No significant difference ($\chi^2 = 0$) where the proportion of IES funded studies reported using a quantitative data analysis method is equal to the proportion of journal articles that reported a quantitative data analysis.
Utilized Quantitative Analysis Method of Complexity Level 1	Statistically significant difference ($\chi^2 = 94.039$, $p < 0.05$) where the number of journal articles reported using a quantitative data analysis method of complexity level 1 was significantly more than IES funded studies.

Chi-Square Two-Proportion Test	Results
Utilized Quantitative Analysis Method of Complexity Level 2	Statistically significant difference ($\chi^2 = 132.39$, $p < 0.05$) where the number of journal articles reported using a quantitative data analysis method of complexity level 2 was significantly more than IES funded studies.
Utilized Quantitative Analysis Method of Complexity Level 3	Statistically significant difference ($\chi^2 = 6.33$, $p < 0.05$) where the number of IES funded studies reported using a quantitative data analysis method of complexity level 3 was significantly more than journal articles.
Utilized Quantitative Analysis Method of Complexity Level 4	Non-significant statistical difference ($\chi^2 = 0.166$, $p > 0.05$) where the number of IES funded studies that used a quantitative data analysis method of complexity level 4 did not significantly differ from journal articles.
Utilized Quantitative Analysis Method of Complexity Level 5	Statistically significant difference ($\chi^2 = 5.04$, $p < 0.05$) where the number of journal articles reported using a quantitative data analysis method of complexity level 5 was significantly more than journal articles.
Utilized Quantitative Analysis Method of Complexity Level 6	Statistically significant difference ($\chi^2 = 26.33$, $p < 0.05$) where the number of IES funded studies reported using a quantitative data analysis method of complexity level 6 was significantly more than journal articles.
Utilized Quantitative Analysis Method of Complexity Level 7	Statistically significant difference ($\chi^2 = 231.04$, $p < 0.05$) where the number of IES funded studies reported using a quantitative data analysis method of complexity level 7 was significantly more than journal articles.
Utilized Quantitative Analysis Method of Complexity Level 8	Statistically significant difference ($\chi^2 = 27.43$, $p < 0.05$) where the number of IES funded studies reported using a quantitative data analysis method of complexity level 8 was significantly more than journal articles.