An Agenda for Open Science in Communication

Power Analyses

Description of the field Communication

Data taken from Rains, S. A., Levine, T. R., & Weber, R. (2018). Sixty years of quantitative communication research summarized: Lessons from 149 meta-analyses. Annals of the International Communication Association, 42(2), 105–124. https://doi.org/10.1080/23808985.2018.1446350.

```
##             Topic.area N.analyses Mean.k   SD.k Median.k Mean.n    SD.n Median.n
## 1           Persuasion         37     51  48.00       38  10213   16697     4269
## 2                Media         35     69 189.00       25  10889   20882     5456
## 3        Interpersonal         34     37  38.00       22  18445   67422     3631
## 4        Instructional         23     44  37.00       29  16069   23131     6206
## 5               Health         15     34  31.00       23 493172 1771956     5866
## 6 Organizational Group          5     53  69.00       19   2565    2497     1956
## 7             Combined        149     49  98.45       28  63094     572     4663
```

```
##             Topic.area Mean.r SD.r Median.r Mean.n.k Median.n.k
## 1           Persuasion   0.18 0.19     0.13      200        112
## 2                Media   0.20 0.11     0.18      158        218
## 3        Interpersonal   0.24 0.15     0.20      499        165
## 4        Instructional   0.24 0.15     0.22      365        214
## 5               Health   0.18 0.13     0.14    14505        255
## 6 Organizational Group   0.25 0.18     0.22       48        103
## 7             Combined   0.21 0.15     0.18     1288        167
```

Transformation to other effects sizes

It is possible to directly transform most effect sizes. Here, we transfer the reported effect size r to for example Cohen's d. For more information, see, for example, https://www.psychometrica.de/effect_size.html.

```
##             Topic.area Median.r Median.d Median.etasq Median.odds Median.f
## 1           Persuasion     0.13     0.26         0.03        1.61     0.13
## 2                Media     0.18     0.37         0.06        1.94     0.18
## 3        Interpersonal     0.20     0.41         0.07        2.10     0.20
## 4        Instructional     0.22     0.45         0.08        2.27     0.23
## 5               Health     0.14     0.28         0.04        1.67     0.14
## 6 Organizational Group     0.22     0.45         0.08        2.27     0.23
## 7             Combined     0.18     0.37         0.06        1.94     0.18
```

Estimated power for correlational designs

Here we estimate the statistical power for a bivariate correlational design for four different potential effect sizes.

```
##             Topic area r = Median r r = .10 r = .15 r = .20
## 1           Persuasion         0.28    0.18    0.35    0.57
## 2                Media         0.76    0.31    0.60    0.85
## 3        Interpersonal         0.73    0.25    0.49    0.73
## 4        Instructional         0.90    0.31    0.59    0.84
## 5               Health         0.61    0.36    0.67    0.90
## 6 Organizational Group         0.61    0.17    0.33    0.53
## 7             Combined         0.65    0.25    0.49    0.74
```

Power analyses for other designs

Here, we estimate the statistical power for other typical designs for the actual effect size reported by Rains et al. (2018).

```
##             Topic area Correlation t-test ANOVA 2 groups ANOVA 3 groups ANOVA 4 groups
## 1           Persuasion        0.28   0.28           0.28           0.21           0.18
## 2                Media        0.76   0.77           0.77           0.67           0.60
## 3        Interpersonal        0.73   0.74           0.74           0.64           0.57
## 4        Instructional        0.90   0.91           0.91           0.84           0.79
## 5               Health        0.61   0.61           0.61           0.51           0.44
## 6 Organizational Group        0.61   0.62           0.62           0.51           0.44
## 7             Combined        0.65   0.65           0.65           0.54           0.48
```