Exercises for Dependent Effect Sizes

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Data

Below I am loading the Tanner-Smith and Lipsey (2015) data that I went over in the presentation.

```
library(tidyverse)

load("tsl_dat_20.RData")

glimpse(tsl_dat)
```

```
## Rows: 207
## Columns: 6
## $ study  <dbl> 2269, 2269, 2269, 2269, 2269, 2269, 2343, 2343, 2343, 2343, 234~
## $ es_num <dbl> 9587, 9591, 9586, 9590, 9589, 9588, 5420, 5444, 5449, 5443, 543~
## $ delta  <dbl> -0.206957942, -0.466804706, -0.206957942, -0.478899623, 0.00000~
## $ v      <dbl> 0.002105731, 0.002151562, 0.002105731, 0.002154557, 0.002094519~
## $ dv     <fct> fu, qu, fu, qu, qu, qu, bac, qu, bac, pc, fhu, qu, bac, qu, fhu~
## $ g2age  <dbl> 19.7, 19.7, 19.7, 19.7, 19.7, 19.7, 20.6, 20.6, 20.6, 20.6, 20.~
```

Questions

1. Calculate the number of studies and calculate the number of effect sizes within each study?
2. What is dependence? How can it occur in a meta-analytic dataset?
3. Calculate the average effect of brief alcohol intervention not accounting for any moderators using `robu()` from `robumeta`.
4. Run a meta-regression model with just `dv` (dependent variable measure) as a moderator. Estimate the effect of dependent variable of effect of brief alcohol interventions.
5. In the prior analyses, what kind of test and corrections does `robumeta` implement by default? What would be the consequence if we ignored the dependent structure of the meta-analytic data?
6. Using the meta-regression model you estimated in question 4, run a multiple-contrast hypothesis test to examine if effects differ according different dependent variable measures using the `Wald_test()` function from `clubSandwich` package. Use CR2 correction and HTZ test.
7. According to the results of my simulation studies, what could potentially be the problem in the result of the multiple-contrast test you just conducted? Why would practitioners and policy-makers care about this problem?
8. Run multiple-contrast hypothesis test using `Wald_test_cwb()` from `wildmeta`. Compare the p-values that you calculated from from `wildmeta` and `clubSandwich`.