Designing your poster

17 November 2021

Modern Research Methods

Notes on coding papers

- The **moderator names** that you enter in your codebook should match the names of the green variables in your MA data spreadsheet.
- Make sure the values you enter are **readable by R.** For example, if you enter "18 months" into your spreadsheet for age, R is going to treat it as a categorical variable, rather than a number. The correct way to enter this value is simply as 18 (you know it's months from your codebook).
- **Don't do any calculations in the spreadsheet** by, e.g., using equations. These aren't easily reproducible. Instead, we'll do all the calculations that need to be done later with an R script.
- When defining values for your **categorical moderators**, your values should be machine AND human readable. If you code values using numbers 0/1, it's very easy to get the values confused. Fortunately, R is happy to deal with descriptive labels (e.g., "feedback"/"no feedback").
- In some cases, you may need to **estimate means and SD/SE from plots**. You can do this using any draw program (e.g. powerpoint), or by using an app online (like this one: http://www.graphreader.com/). The app allows you to define the axes and then it will tell you the values of points that you click on. When you estimate SD/SE from the error bars, the SD/SE corresponds to only one "arm" of the error bar.
- **Missing data** – NA (not “not reported”)

Logistics

- Each **person** should code 5 papers (which will each have several ES)
- On Friday, work on converting raw data to effect sizes
- Poster draft due Tuesday (11/23, noon)
  - Should include 4 key figures and text
  - Along with your poster, submit the markdown that you used to create your plots
- 1 **markdown** and 1 **poster** per group (1 person from each group should turn in html of markdown on Canvas)

Poster Session Details

- In conjunction with two other research methods courses
- In person poster session (4:30-6pm on Thursday, 12/2),
- Provide 4 min verbal presentation of poster (each group member speaks)
- Judges will ask questions
- Presentations evaluated for clarity, originality, and ability to answer questions

Principles of Data Visualization (from week 4)

- Visualization as **communication**
  - There is no list of rules for what makes a good visualization
  - Design depends on the message you want to communicate
  - And, who your audience is.

- Your goal is to make it as easy as possible for your audience to understand your message.
- Too much detail/information means your audience might not get the intended message.

Principles of ~~Data Visualization~~ Poster Presentations

- Presentation as **communication**
  - Design depends on the message you want to communicate
  - And, who your audience is.
- Your goal is to make it as easy as possible for your audience to understand your message.
- Too much detail/information means your audience might not get the intended message.
- You will have done a lot of analyses – include what is most important/interesting!

Poster presentation guidelines

- Who is your audience? Smart psychologists (mostly other faculty) that may or may not be familiar with your phenomenon or the basics of meta-analysis
- There are lots of details to your methods/results – your job is to glean it down to the most important ones
- The judges will likely have questions about things you didn't have time to talk about – that's great!
  - Be ready to answer questions about the details of your method/results!
- Many of the specific design guidelines we talked about in the context of data visualization, also apply here (e.g. avoid junk, too much info)

Poster Template

Template in template folder on Google drive

You should adapt this template for your MA, keeping in mind the design principles we've talked about.

Your poster should not use smaller than 26 font for the main text.

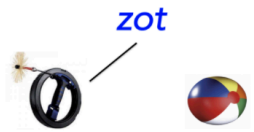
Dimensions are 3' x 4' - don't change this!!

A meta-analysis of the mutual exclusivity effect in word learning [TEMPLATE]

Molly Lewis and other group members
Carnegie Mellon University
Modern Research Methods

Background

- Mapping a word to its referent is an under-constrained learning problem.
- One of the mechanisms hypothesized to constrain the problem is a bias to map novel words to novel objects – termed the "Mutual exclusivity (ME) effect"



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Research Goal: Evaluate the degree of publication bias in the ME literature, estimate the size of the effect, and examine potential moderators.

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- Inclusion criteria: child participants, no prior experience with objects, etc.
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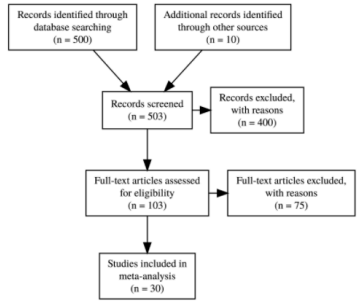
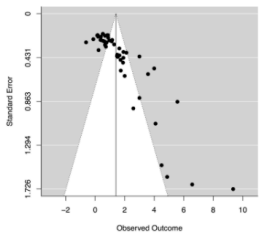
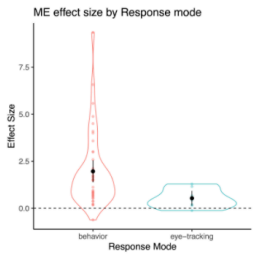


Results

- 50 effect sizes
- Some evidence for publication bias
- Overall effect size is 1.41 [1.06, 1.75]
- Effect is bigger in X than Y, and is larger when X is larger (moderator analyses)





Conclusion and Next Steps

- Mutual exclusivity is a robust effect with a large effect size.
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- Next steps: Explore additional moderators (which ones?), and code remaining papers (how many?).

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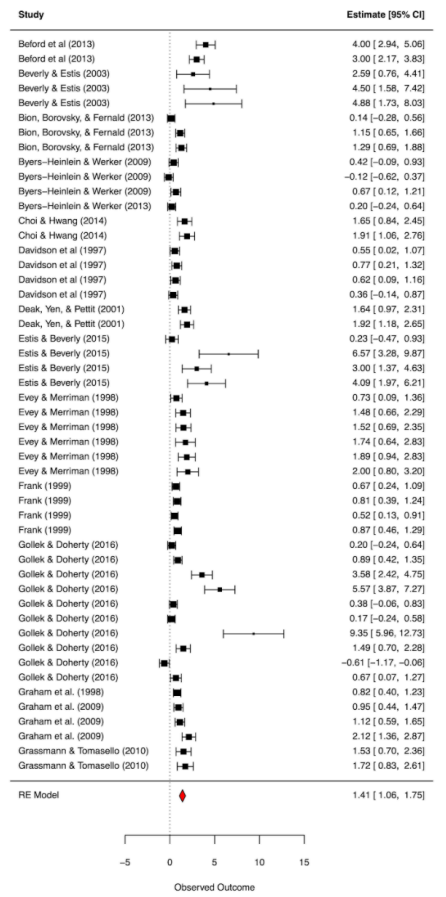

Poster structure

6 parts….

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Molly Lewis and other group members
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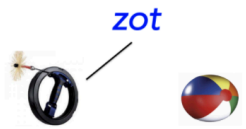

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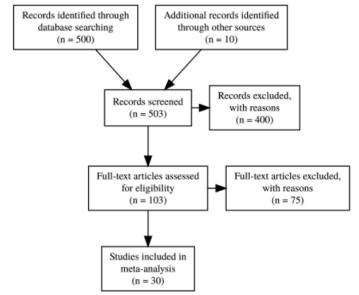

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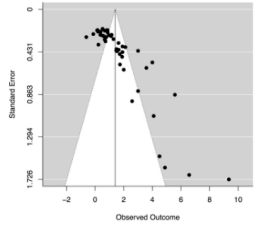

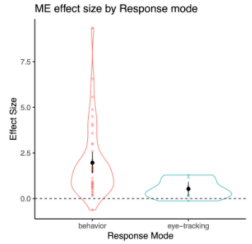

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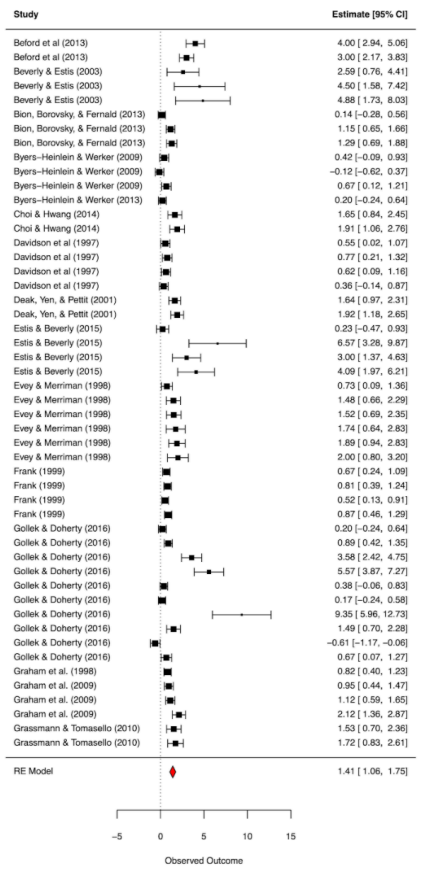

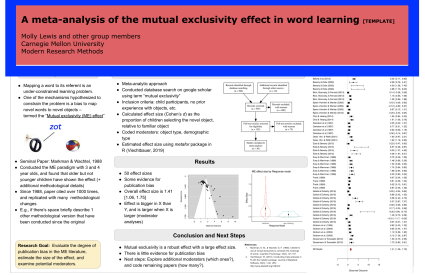

A meta-analysis of the mutual exclusivity effect in word learning [TEMPLATE]

Molly Lewis and other group members
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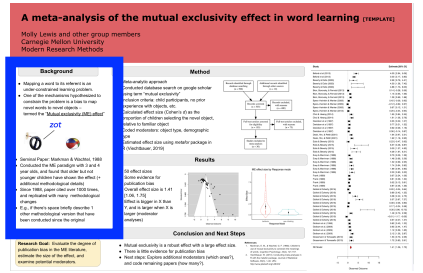
- Informative title
- Title should contextualize the effect
  - "Meta-analysis of mutual exclusivity in word learning" is better than "Mutual exclusivity meta-analysis"
- Even better: Framing your title around a research question/finding
  - "Understanding the relationship between vocabulary and the mutual exclusivity effect through meta-analytic data"

The background section should explain the motivation for conducting the meta-analysis



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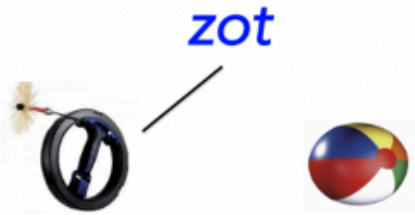

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Broad question

Narrower question, relates to theory

Introduces name of effect

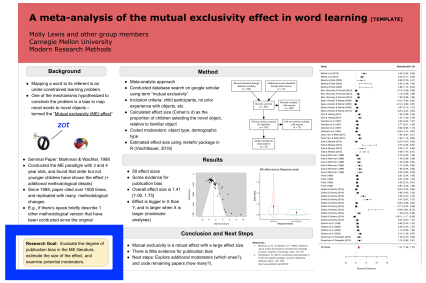
Schema of paradigm

Seminal paper

Brief description of seminal paper

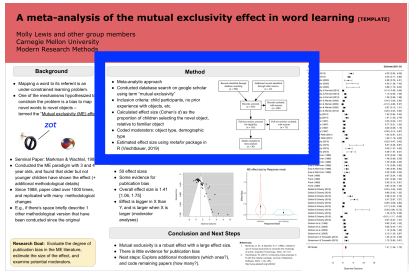
Brief summary of literature

Briefly describe 1 methodological variations just to give the audience a sense of the variability in the literature



- What are your research goals?
- Similar to “hypothesis” section of experimental poster.
- “examine the difference in learning between monotonic and non-monotonic functions”

Research Goal: Evaluate the degree of publication bias in the ME literature, estimate the size of the effect, and examine potential moderators.



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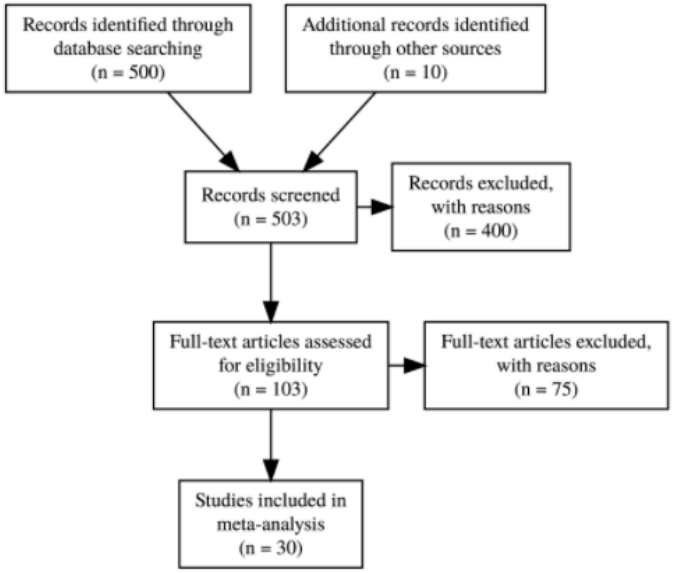


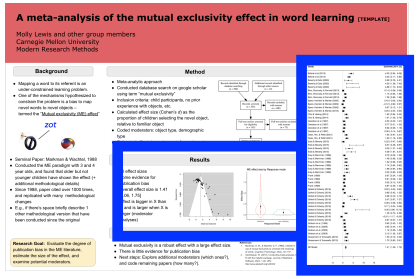
Brief description of your search protocol

Description of effect size metric

What moderators did you code?

What software did you use? This will be the same for everyone.

Prisma flow diagram



Total number of effect sizes actually used in your analyses (rows)

Does it look like there's evidence for publication bias based on looking at the funnel plot?

Overall effect size and confidence interval (this should match the values corresponding to the red diagram on the forest plot)

Funnel plot

Moderator plot (continuous or categorical)

Forest plot

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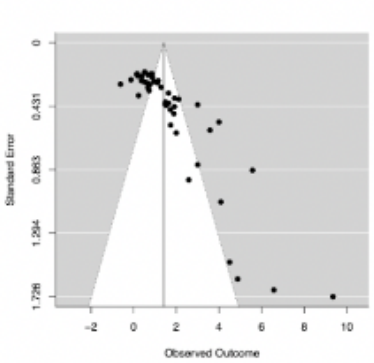
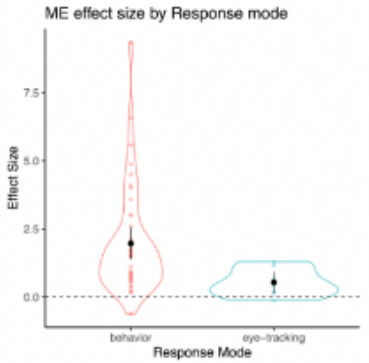
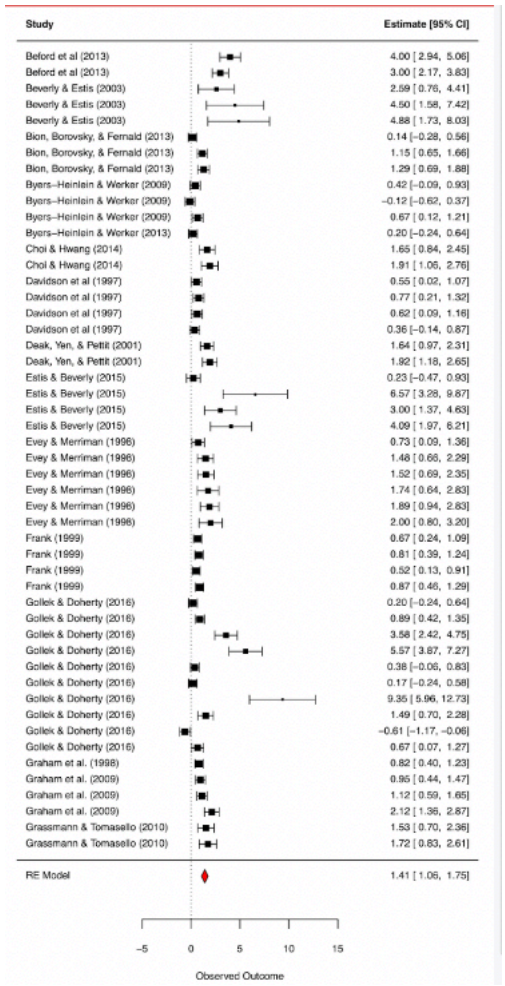
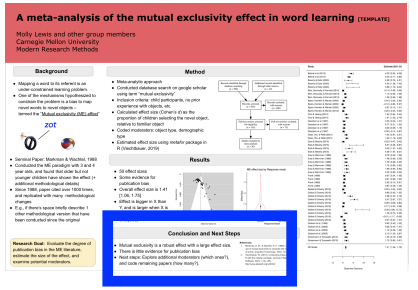




Description of your moderator analyses. There's only room to plot 1-2, but you can describe more.





Summary of effect size (relate to Cohen's descriptions of "small", "medium" and "large" effect sizes, if using Cohen's d)

Summarize publication bias

Summarize moderator findings

Conclusion and Next Steps

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What would you do if you had infinite time?

References: Seminal paper, Metafor software, any other paper you reference

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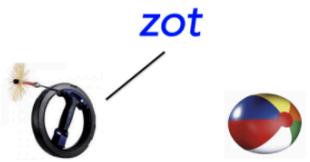

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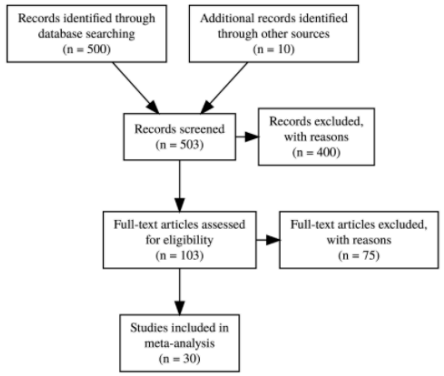

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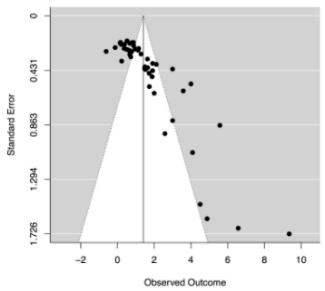

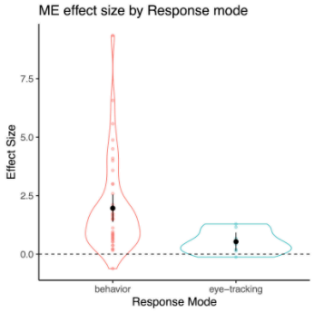

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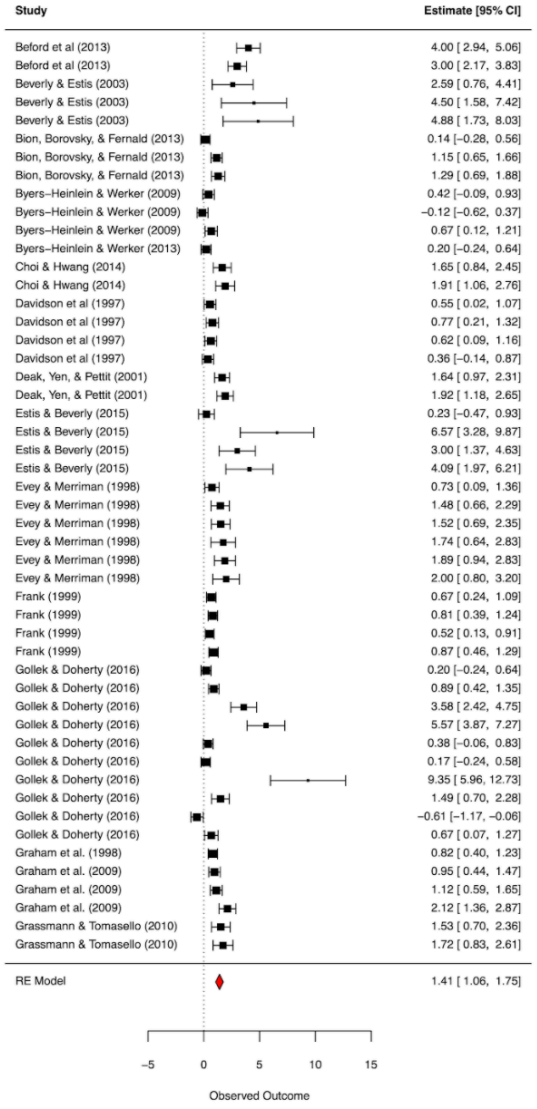
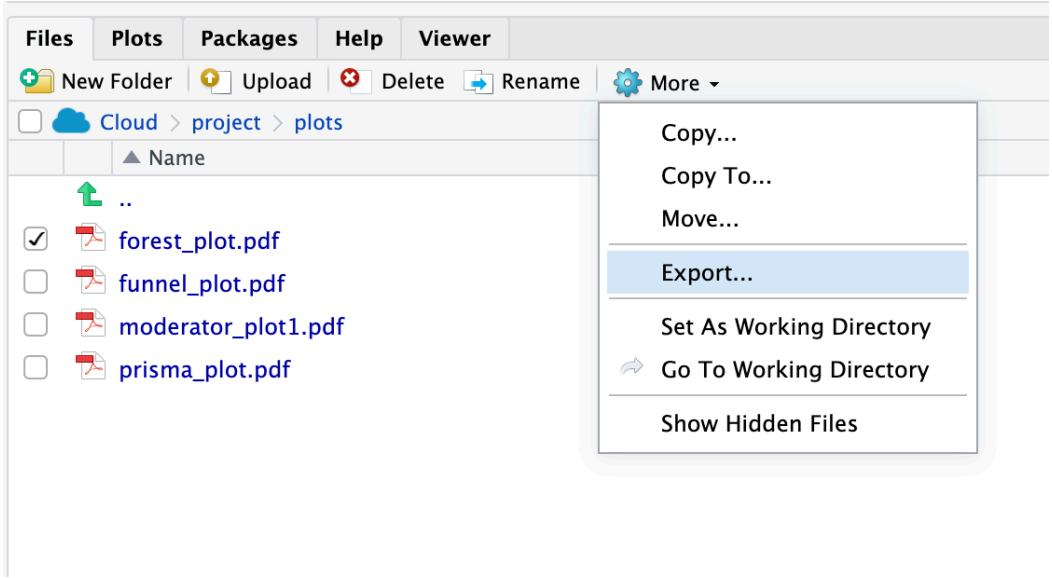
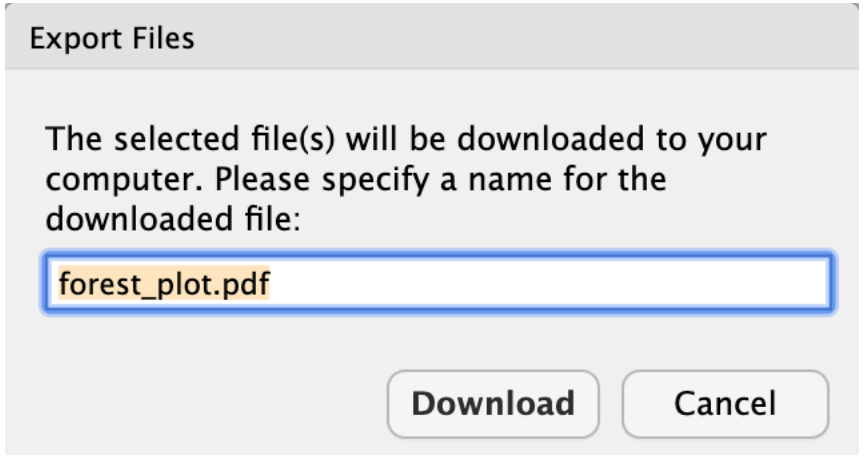


Once I have a plot in Rstudio, how do I get it into my google slideshow?

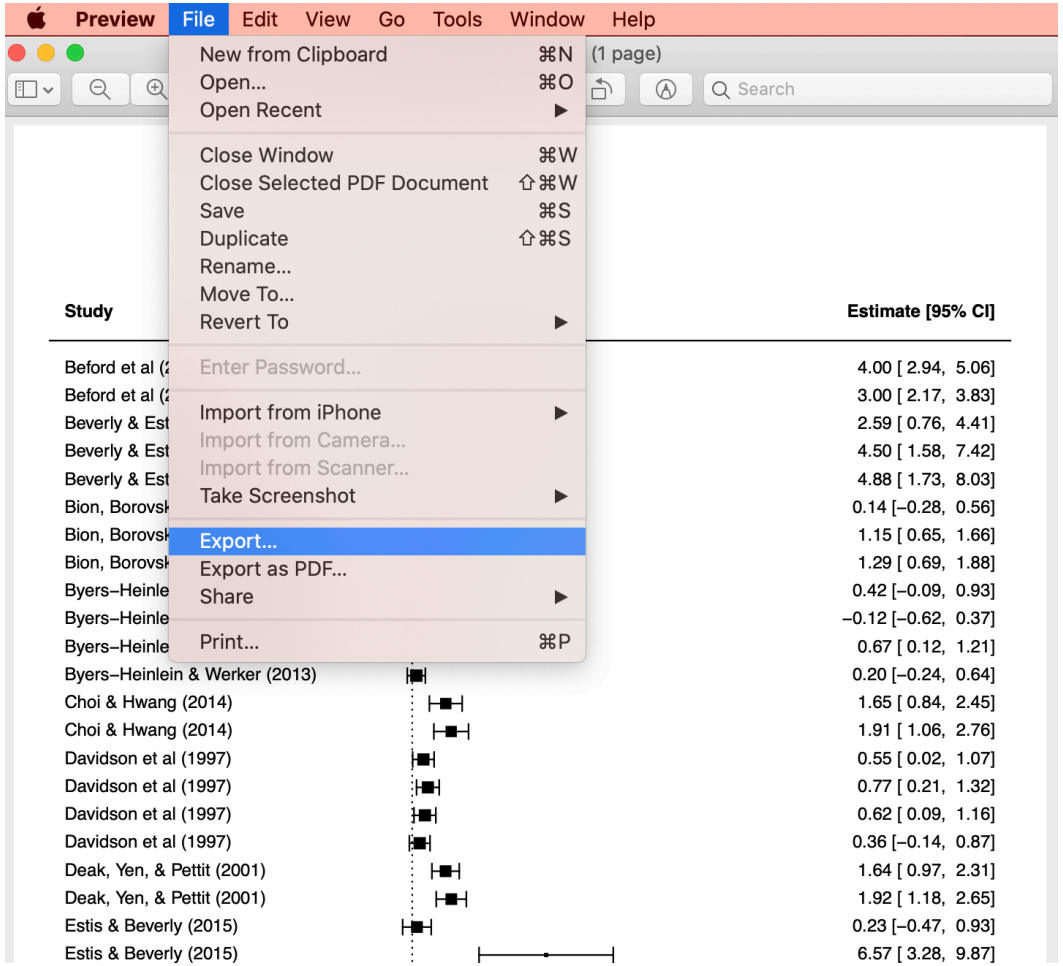
- The best way to save a high quality plot in R is as a pdf
- But! You can't insert a pdf into a google slide show
- So, we need to convert the pdf into a png before adding it to our poster

* No screenshots!

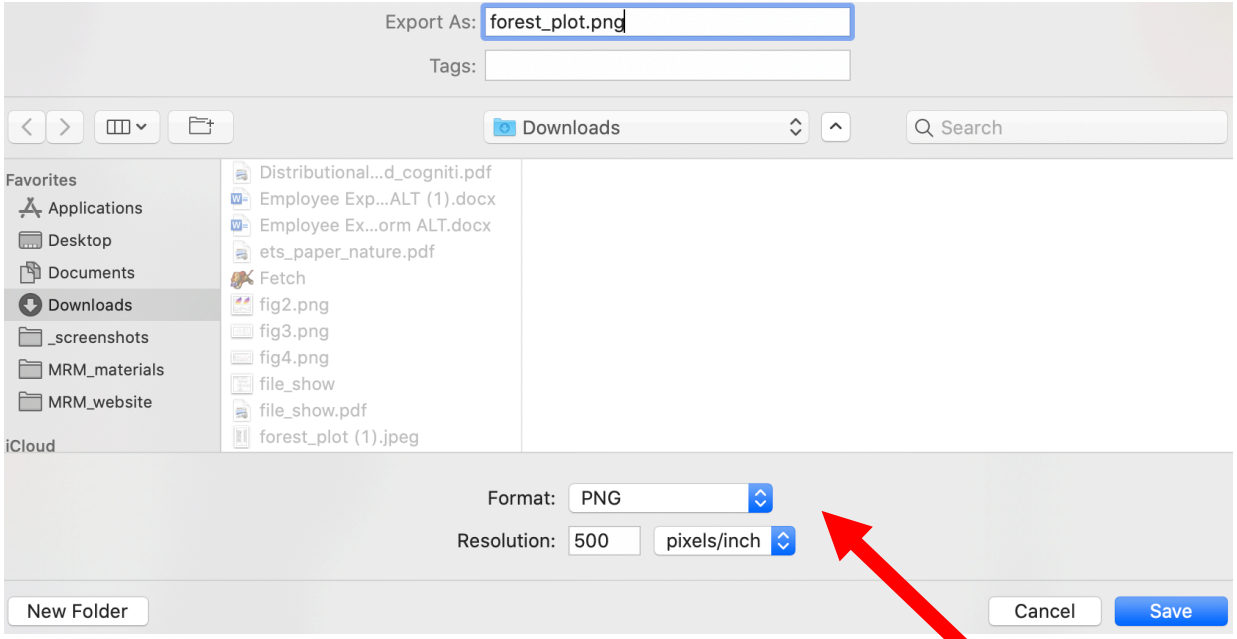




Open the file in preview (or some other pdf reader), then export



Export as png



Now you should be able to insert your plot into your poster!