Let’s RMarkdown

R + Markdown

- Code + Text
- Useful for:

  1) Summary reports
  2) Manuscripts
  3) Collaborating

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- Useful for:
  1) Summary reports
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- Output formats:
  HTML
  PDF
  MS Words

Rmd
knitr
md
pandoc
pdf
html
word

Structure

slide.Rmd

Knit Insert Run

```
1  ---
2  title: "rmarkdown"
3  author: "Sue Song"
4  date: '2018-11-04'
5  output: powerpoint_presentation
6  ---
7
8  ```{r setup, include=FALSE}
9  knitr::opts_chunk$set(echo = FALSE)
10 ```
11
12 # Let's RMarkdown
13
14 ## Prerequisites
15 - RStudio
16 - RMarkdown
17 ```{r}
18 install.packages("rmarkdown")
19 ```
```

1. Header

2. Code Chunk

3. Text Paragraphs

26:1 # Structure R Markdown

1. **Header**

Metadata (YAML)

```yaml
---
title: "rmarkdown"
author: "Sue Song"
date: '2018-11-04'
output:
  word_document: default
bibliography: zotero_ref.bib
---

```

2. **Code Chunks**

Step 1. Insert code chunks

Ctrl + Alt + I (Windows); *Cmd + Option + I* (Mac)

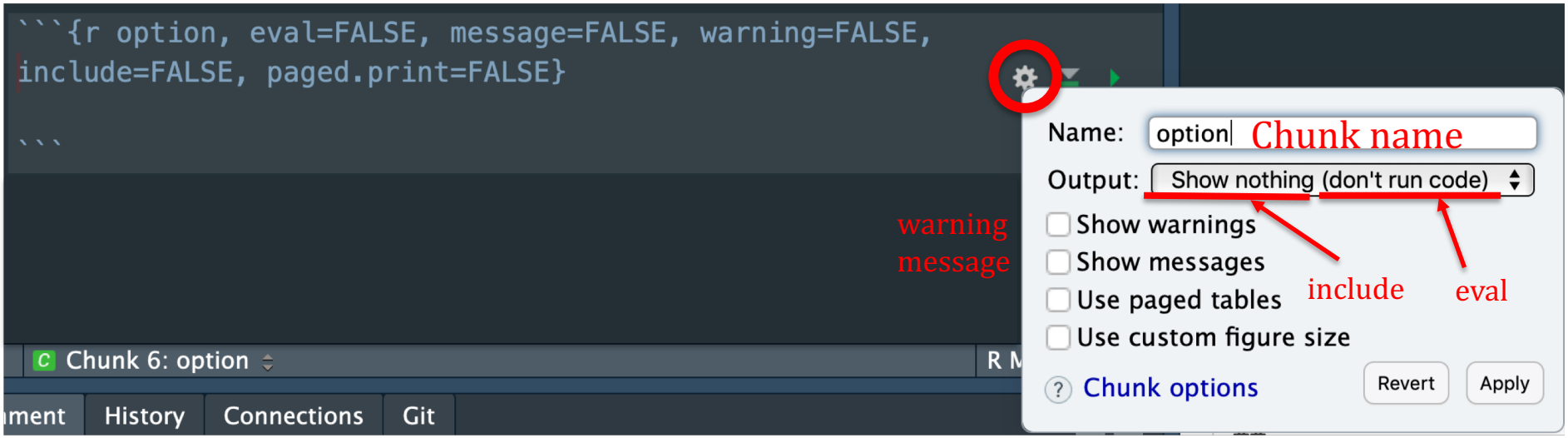
```
```{r chunk_name}

```
```

Step 2. Define chunk options

```
```{r chunk_name, eval=FALSE, message=FALSE, warning=FALSE,
include=FALSE, paged.print=FALSE}

```
```

Chunk options

```
```{r chunk_name, eval=FALSE, message=FALSE, warning=FALSE,
include=FALSE, paged.print=FALSE}

```
```

	TRUE	FALSE
echo	`(x <- 1 + 1)` `## [1] 2`	`## [1] 2`
include	`## [1] 2`	

warning
message
	`library("lavaan")`
	`## This is lavaan 0.6-3`
	`## lavaan is BETA software! Please report any bugs.`
		`library("lavaan")`

Chunk options



Chunk options

Global options for manuscript

```{r global_options, message=FALSE, include=FALSE}
knitr::opts_chunk$set(echo=TRUE,
                      warning=FALSE,
                      message=FALSE,
                      cache=TRUE,
                      highlight = TRUE,
                      fig.width = 8,
                      fig.height = 5)
```

2. **Code Chunks**

Step 1. Insert code chunks

Ctrl + Alt + I (Windows); *Cmd + Option + I* (Mac)

Step 2. Define chunk options

Step 3. Code away

- Run analyses
- Create a plot
- Create a table

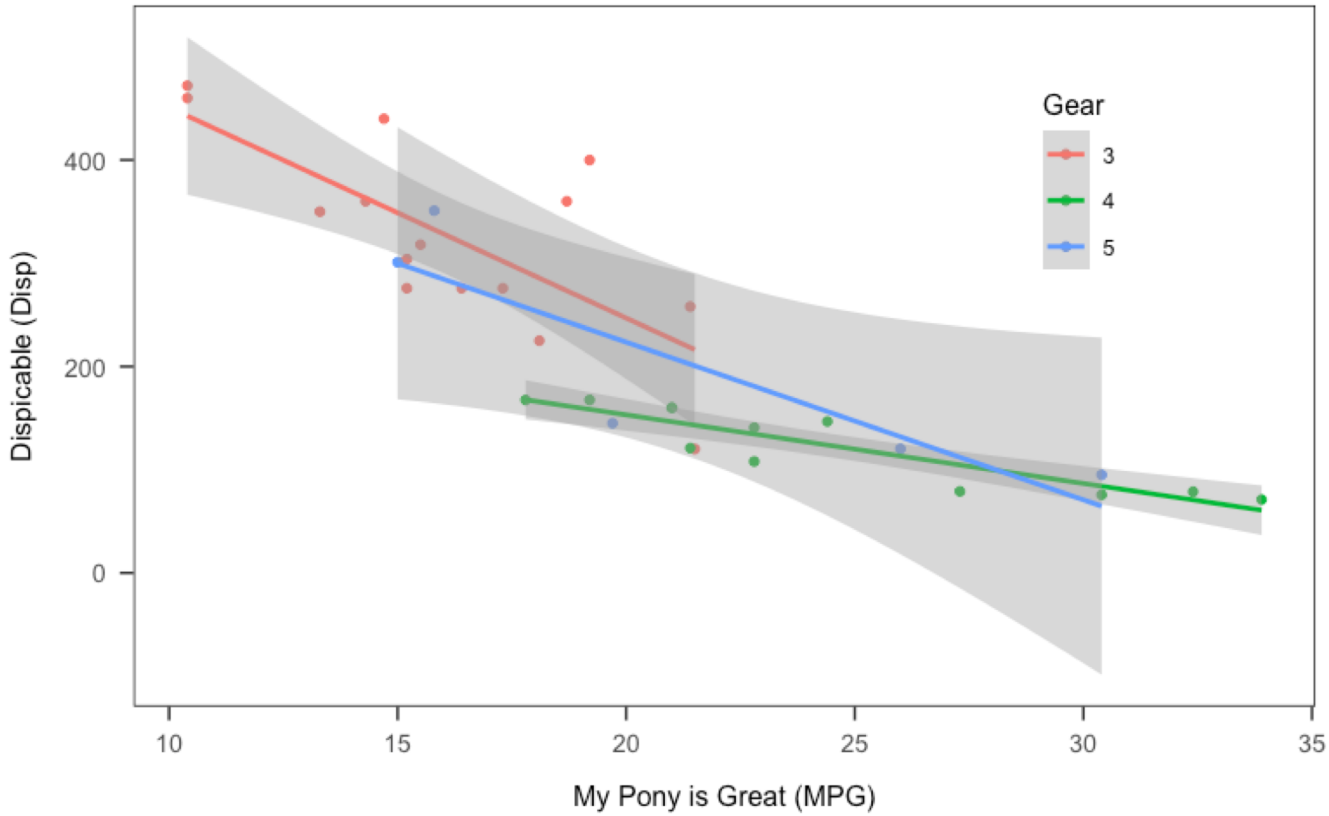
Statistical analyses

```
summary(lm.fit <- lm(disp ~ as.factor(gear)*wt,
                     data = mtcars))
```

```
##
## Call:
## lm(formula = disp ~ as.factor(gear) * wt, data = mtcars)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -74.125 -21.352  -4.293  23.814  83.417
##
## Coefficients:
##                      Estimate Std. Error t value Pr(>|t|)
## (Intercept)            -50.16      56.99  -0.880    0.387
## as.factor(gear)4        26.55      80.74   0.329    0.745
## as.factor(gear)5       -66.28      93.83  -0.706    0.486
## wt                      96.71      14.34   6.746  3.7e-07 ***
## as.factor(gear)4:wt    -40.68      25.67  -1.585    0.125
## as.factor(gear)5:wt     24.43      30.82   0.793    0.435
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 44.68 on 26 degrees of freedom
## Multiple R-squared:  0.891,  Adjusted R-squared:   0.87
## F-statistic:  42.5 on 5 and 26 DF,  p-value: 1.058e-11
```

Plots

```
ggplot(mtcars, aes(x = mpg, y = disp, colour = as.factor(mtcars$gear))) +
  geom_point() +
  geom_smooth(method = "lm") +
  labs(x = "My Pony is Great (MPG)",
       y = "Dispicable (Disp)") +
  scale_color_discrete("Gear") +
  papaja::theme_apa(box = T) +
  theme(legend.position = c(0.8, 0.75))
```



Tables

Test statistics

```
knitr::kable(coef(summary(lm(disp ~ wt*as.factor(gear),
                             data = mtcars))),
             digits = 2)
```

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-50.16	56.99	-0.88	0.39
wt	96.71	14.34	6.75	0.00
as.factor(gear)4	26.55	80.74	0.33	0.74
as.factor(gear)5	-66.28	93.83	-0.71	0.49
wt:as.factor(gear)4	-40.68	25.67	-1.58	0.13
wt:as.factor(gear)5	24.43	30.82	0.79	0.44

3. Text paragraphs

- Formatting
  - Cheetsheet
- Body paragraphs
  - inline codes
- References

Formatting

Syntax	Becomes
`Plain text`	Plain text
`End a line with two spaces to start a new paragraph.`	End a line with two spaces to start a new paragraph.
`*italics* and _italics_`	*italics* and *italics*
`**bold** and __bold__`	**bold** and **bold**
`superscript^2^`	superscript^2
`~~strikethrough~~`	~~strikethrough~~
`[link](www.rstudio.com)`	link
`# Header 1`	# Header 1
`## Header 2`	## Header 2
`### Header 3`	### Header 3
`#### Header 4`	#### Header 4
`##### Header 5`	##### Header 5
`###### Header 6`	###### Header 6
`endash: --`	endash: –
`emdash: ---`	emdash: —
`ellipsis: ...`	ellipsis: …
`inline equation: $A = \pi*r^{2}$`	inline equation: $A = \pi * r^2$

Inline codes

`r output`

```
```{r}
x <- 1 + 1
```

Su has `r x` friends.
```

```
x <- 1 + 1
```

Su has 2 friends.

Inline codes

```
...a positive slope, $\beta$ = `r round(coef(lm.fit)[4],2)`, $p$ = `r round(coef(summary(lm.fit))[4, 4],2)`
```

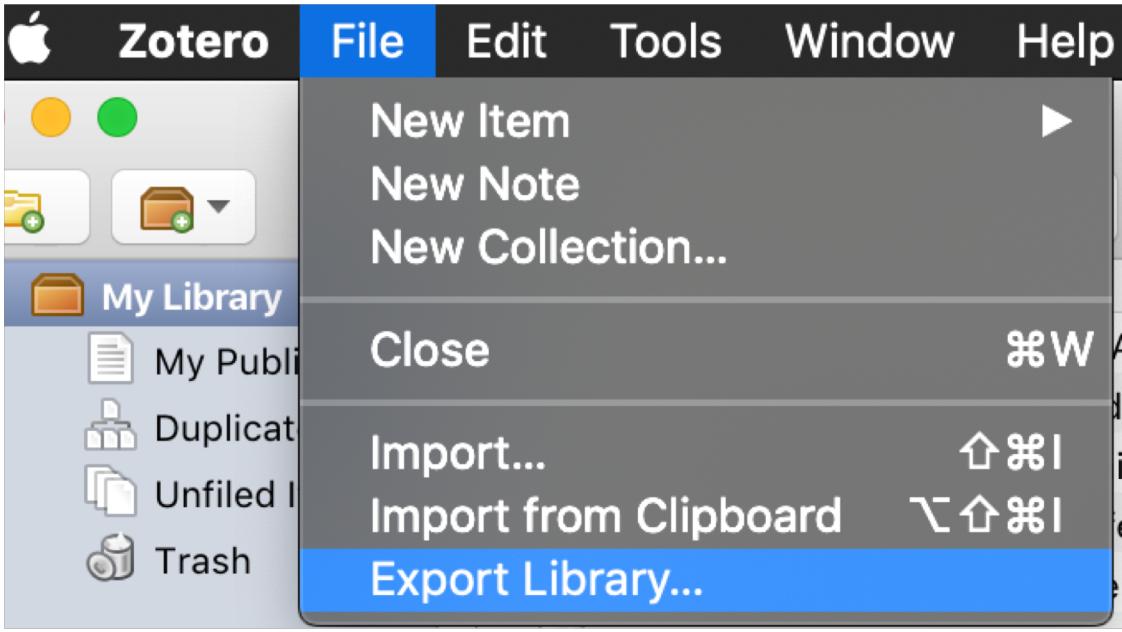
…a positive slope, β = 96.71, p = 0

References

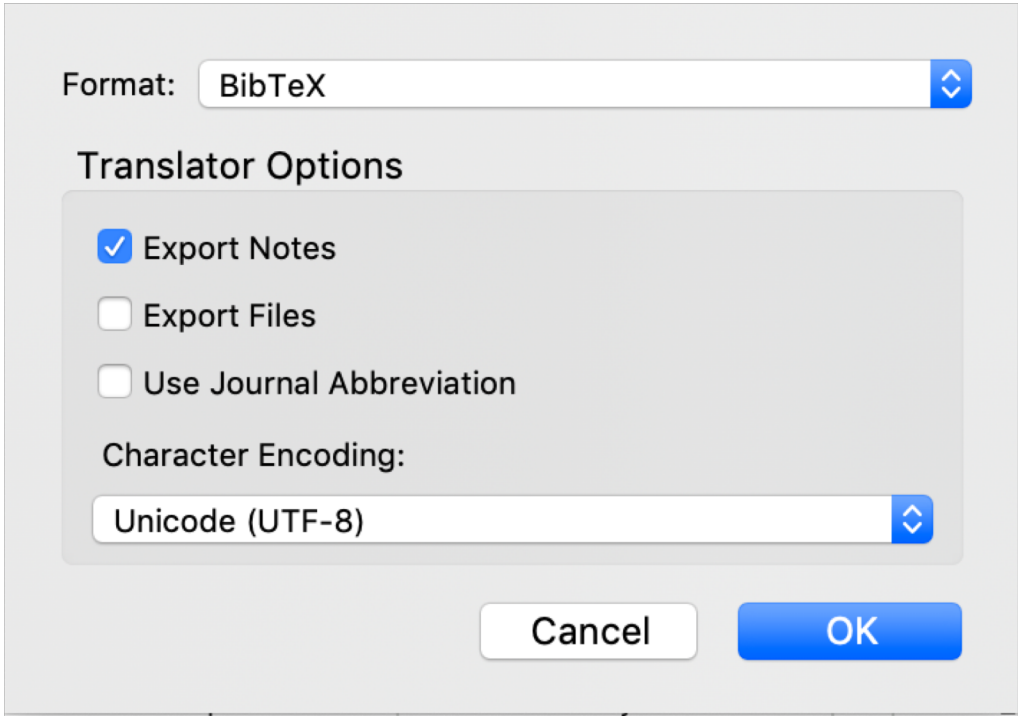
1. Export .bib file from your reference manager (e.g., Zotero/ Mendeley)

Zotero

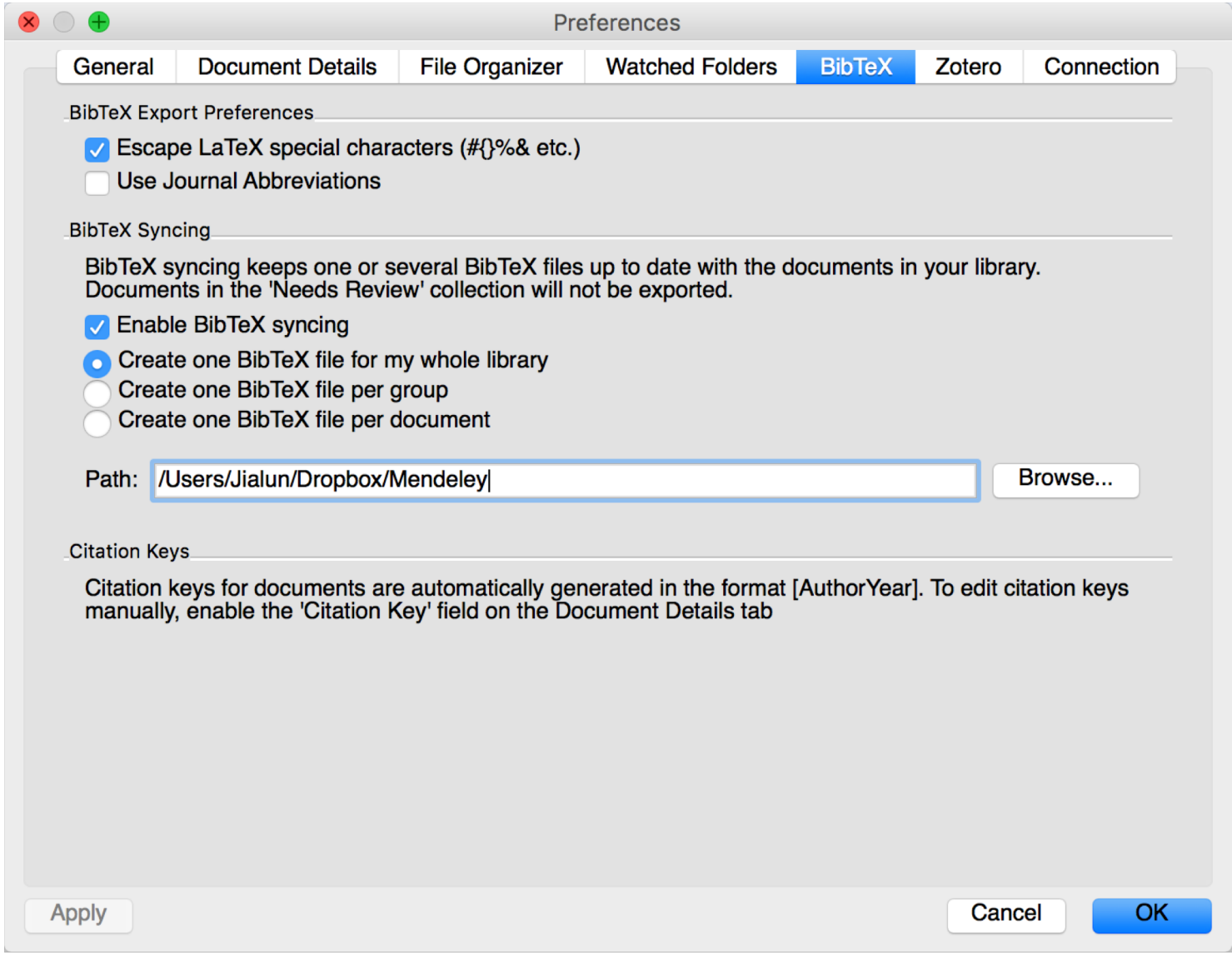
1


Zotero
File
Edit
Tools
Window
Help
New Item
New Note
New Collection...
Close
⌘W
Import...
⇧⌘I
Import from Clipboard
⌥⇧⌘I
Export Library...
My Library
My Publi
Duplicat
Unfiled I
Trash

2


Format:
BibTeX
Translator Options
Export Notes
Export Files
Use Journal Abbreviation
Character Encoding:
Unicode (UTF-8)
Cancel
OK

Mendeley


Preferences
General
Document Details
File Organizer
Watched Folders
BibTeX
Zotero
Connection
BibTeX Export Preferences
Escape LaTeX special characters (#{}%& etc.)
Use Journal Abbreviations
BibTeX Syncing
BibTeX syncing keeps one or several BibTeX files up to date with the documents in your library.
Documents in the 'Needs Review' collection will not be exported.
Enable BibTeX syncing
Create one BibTeX file for my whole library
Create one BibTeX file per group
Create one BibTeX file per document
Path:
/Users/Jialun/Dropbox/Mendeley
Browse...
Citation Keys
Citation keys for documents are automatically generated in the format [AuthorYear]. To edit citation keys manually, enable the 'Citation Key' field on the Document Details tab
Apply
Cancel
OK

References

1. Export .bib file from your reference manager (e.g., Zotero/ Mendeley)
2. Place the .bib file in the same folder as your RMarkdown (.rmd) file
3. Add the following line in your YAML:

```
---
title: "rmarkdown"
author: "Sue Song"
date: '2018-11-04'
output: html_document
bibliography: zotero_ref.bib
---
```

References

1. Export .bib file from your reference manager (e.g., Zotero/ Mendeley)
2. Place the .bib file in the same folder as your RMarkdown (.rmd) file
3. Add the following line in your YAML
4. Cite with *citr* addin (https://github.com/crsh/citr)

References

1. Export .bib file from your reference manager (e.g., Zotero/ Mendeley)
2. Place the .bib file in the same folder as your RMarkdown (.rmd) file
3. Add the following line in your YAML
4. Cite with *citr* addin
5. Append citations for the R packages used with papaja

```
citations <- papaja::cite_r(file="zotero_ref.bib"
                            #, pkgs = c("papaja", "here")
                            #, withhold = F
                            #, footnote = T
                            )
```

(my) Workflow

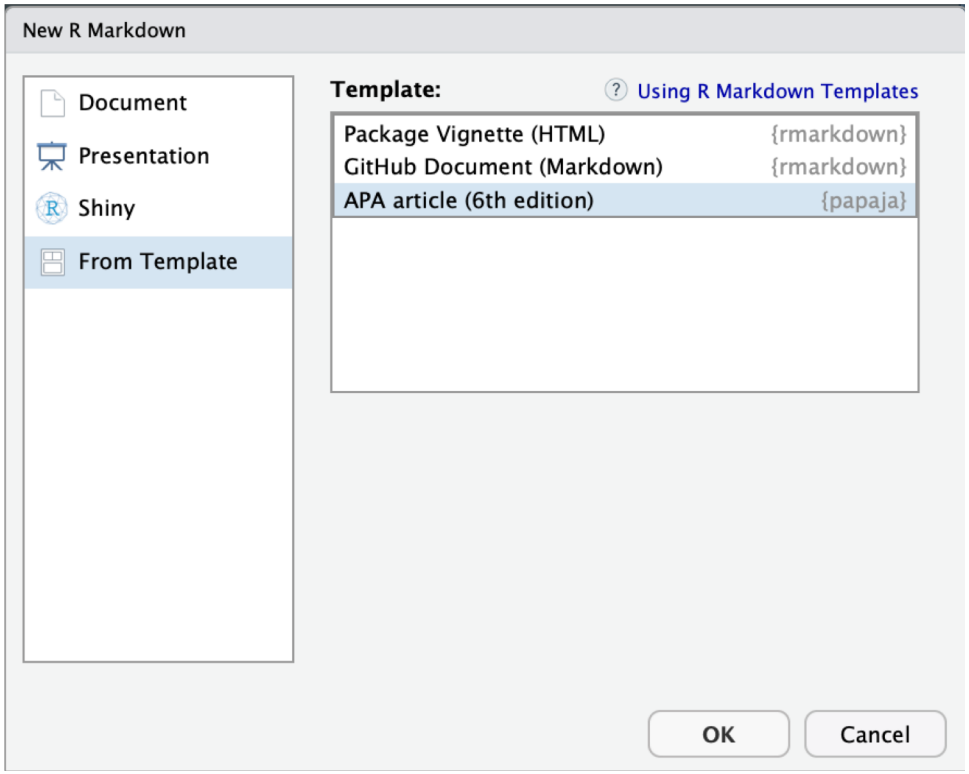
- Varies by goals
  - Lab notebook
  - Pseudo-manuscript
  - Tutorials

Lab Notebook

1. Create a master R-script that processes the raw-data
2. Import the processed dataset in a new RMarkdown file
3. Run analyses like a boss
4. Render in a word document & edit

APA-formatted Manuscript

1. Create a new RMarkdown with a papaja's APA template



APA-formatted Manuscript

1. Create a new RMarkdown with a papaja's APA template
2. Run analyses like a boss
3. Render it as a Word document
4. Revise formatting