Let’s RMarkdown

R + Markdown

- Code + Text
- Useful for:
  1) Summary reports
  2) Manuscripts
  3) Collaborating
- Output formats:
  HTML
  PDF
  MS Words

Exercise

Create a new RMardkwon file in Rstudio

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

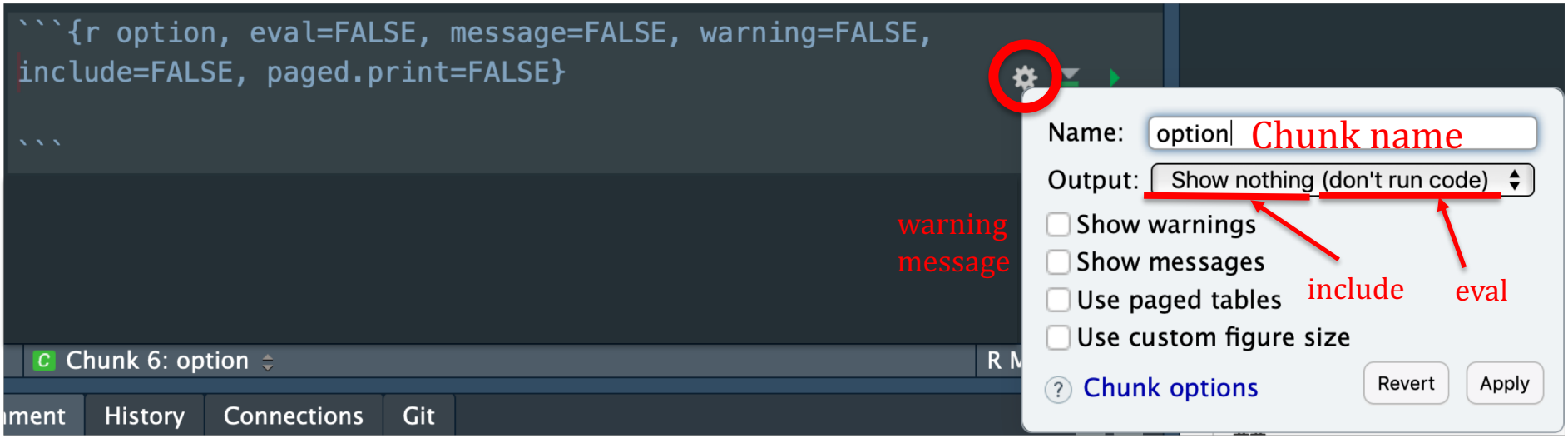
```
```{r chunk_name}

```
```

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

```{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

Step 2. Define chunk options

Step 3. Code away

- Run analyses
- Create a plot
- Create a table

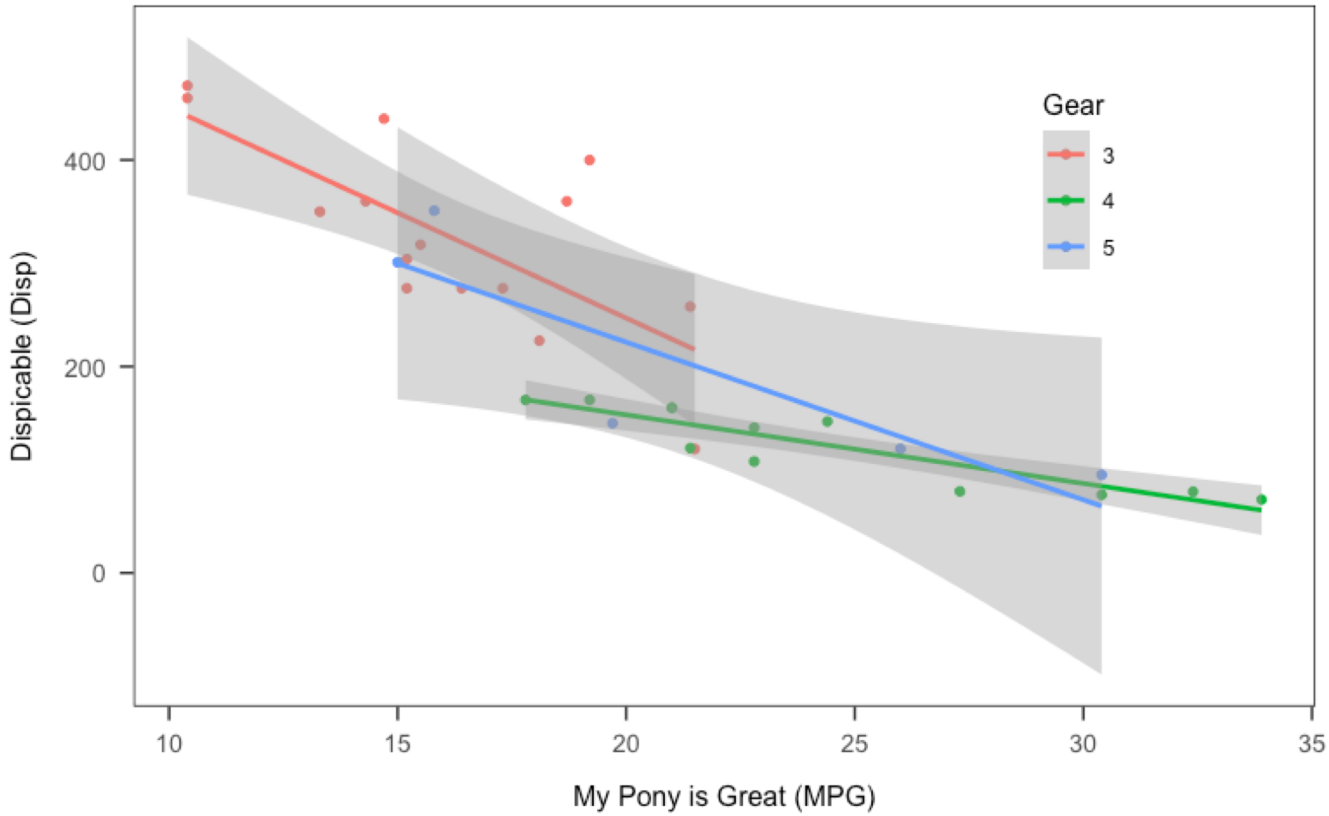
Statistical analyses

```
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
    - https://www.rstudio.com/wp-content/uploads/2015/03/rmarkdown-reference.pdf
- Body paragraphs
  - inline codes
  - external r-scripts
- 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 <code>`

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

Su has `r x` friends.
```

```r
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)
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

(my) Workflow

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

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
2. Run analyses like a boss
3. Render it as a Word document
4. Revise formatting

Preregistration

1. Create a new Rmarkdown document using *prereg* templates
2. Choose a template
3. Import any associated r-scripts using *read_chunk* function
4. Render it as a PDF document & upload it to OSF