

Packages

Are you struggling?

Plan for today

- Brief recap
- **Packages**

Recap of using variables

- Most of the time, we want to do more than add, subtract, multiply etc.
- We want to act on our variables. We do this with operators & **functions**
 - *Each function* has a unique name
 - *Each function* requires some input, and the function can be modified using arguments
 - *Each function* will produce an output
- Remember:
 - objects are *nouns*
 - functions & operators are *verbs*
 - arguments are *adverbs*

Recap of using variables

Where do you find functions?

- Some exist in R by default
 - `t.test()`
 - `cor()`
 - `scale()`

Lots of people all over the world write their own functions. And they (rightly!) think it's useful to share these functions.

Packages

What is a **package**?

- A collection of functions and datasets
- Open source

Packages are the reason R is so powerful!

- While you can definitely write your own functions, most of what you need to do someone else has already done for you!

Files Plots Packages Help Viewer				
<div>  Install  Update  Packrat <input type="text"/>  </div>				
Name	Description	Ver...		
System Library				
<input type="checkbox"/> abind	Combine Multidimensional Arrays	1.4-5		
<input type="checkbox"/> acepack	ACE and AVAS for Selecting Multiple Regression Transformations	1.4.1		
<input type="checkbox"/> arm	Data Analysis Using Regression and Multilevel/Hierarchical Models	1.11-1		
<input type="checkbox"/> AsioHea...	'Asio' C++ Header Files	1.12.2-1		
<input type="checkbox"/> askpass	Safe Password Entry for R, Git, and SSH	1.1		
<input type="checkbox"/> assertthat	Easy Pre and Post Assertions	0.2.1		
<input type="checkbox"/> backports	Reimplementations of Functions Introduced Since R-3.0.0	1.1.6		
<input checked="" type="checkbox"/> base	The R Base Package	4.0.0		
<input type="checkbox"/> base64...	Tools for base64 encoding	0.1-3		

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How do I get packages?

Packages can be downloaded from the *CRAN* (Comprehensive *R* Archive Network)

You will do this from inside *R*

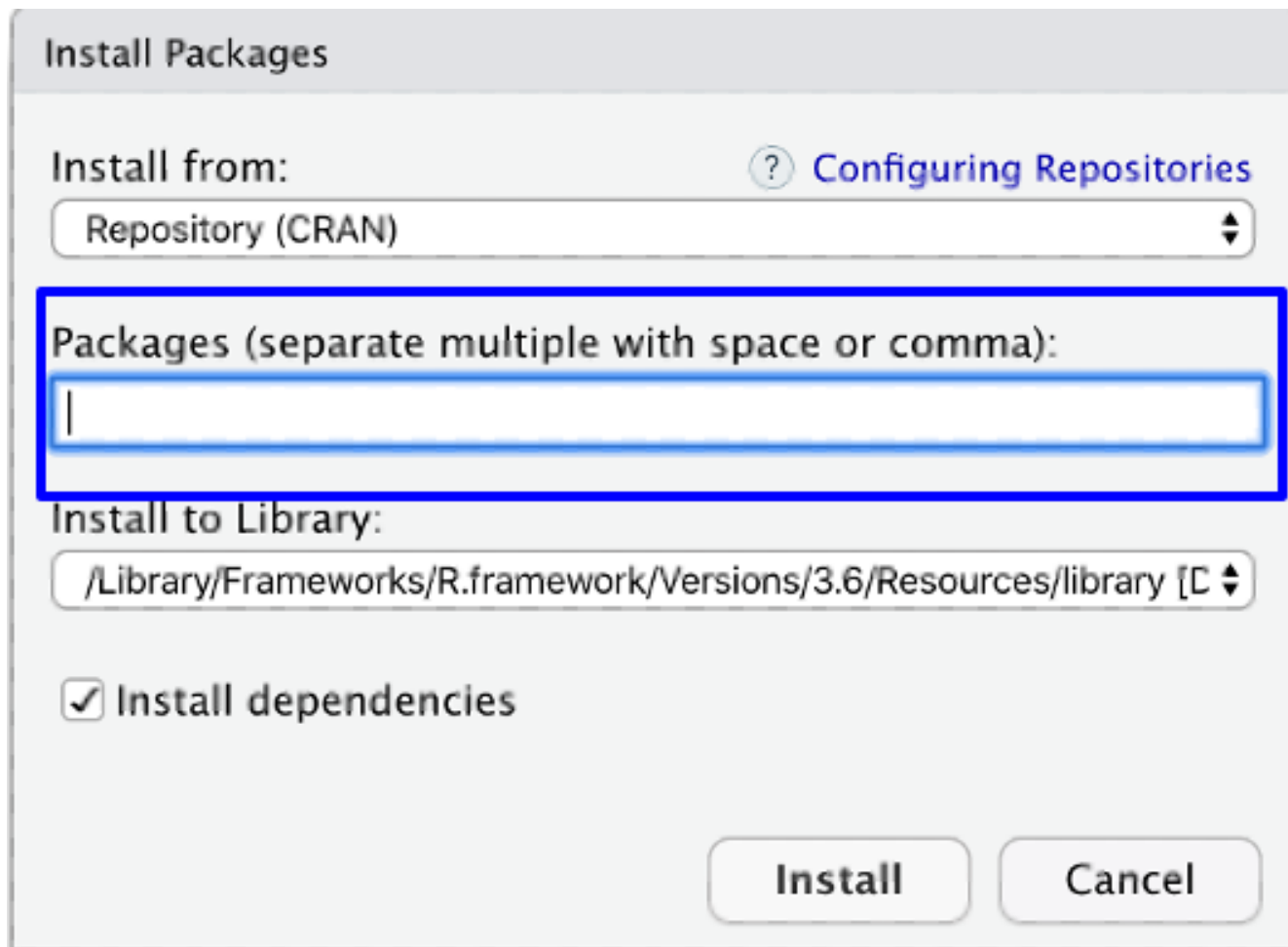
Need to be connected to the internet!

2 ways to install packages

1. Install button in the Packages tab
2. R Code

Either way, you need to know the name of the package

Install Button



The image shows the 'Install Packages' dialog box in RStudio. The title bar is 'Install Packages'. Below it, the 'Install from:' section has a dropdown menu set to 'Repository (CRAN)' and a link to '? Configuring Repositories'. The 'Packages (separate multiple with space or comma):' section has a text input field that is currently empty and is highlighted with a blue rectangular border. Below this, the 'Install to Library:' section shows a path: '/Library/Frameworks/R.framework/Versions/3.6/Resources/library [C]'. At the bottom, there is a checked checkbox for 'Install dependencies' and two buttons: 'Install' and 'Cancel'.

Install Packages

Install from: [? Configuring Repositories](#)

Repository (CRAN)

Packages (separate multiple with space or comma):

Install to Library:

/Library/Frameworks/R.framework/Versions/3.6/Resources/library [C]

☒ Install dependencies

Install Cancel

Install Button

Install Packages

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Install Packages

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☒ Install dependencies

Install Cancel

R code to install packages

```
install.packages("psych")
```

Packages

INSTALLING

- Downloading the package and saving it to your computer
- Like installing Microsoft Word on your computer
- Do this **ONCE**

LOADING

- Like opening Microsoft Word to write a paper
- Once a package is loaded, you can use all of it's functions and datasets are ready to use
- You need to do this **EVERY TIME** you open a new **R** session

2 ways to load packages

1. Checkbox in the packages tab (not recommended)
2. R code

Either way, you need to know the name of the package

R code to load packages

```
library(psych)
```

Dependencies

```
> library(lme4)  
Loading required package: Matrix  
Loading required package: Rcpp
```

Uses functions from other packages

Installed automatically

Loaded automatically

Help! (again)

Ways to find documentation:

`?psych` -- opens documentation specific to that package or function

`??psych` -- searches for this in all documentation (that you have installed and loaded)

To find a package that does what you need: **Google**

Summary

Packages are a collection of functions and data sets

1. You **install** the package once; must be connected to the internet
2. You **load** the package every time you use it; do not need to be connected to the internet

How do you find the function you need? How do you now what package it's in?

- **G-o-o-g-l-e!**
- "structural equation modeling in R"

How do you know how to use the function? What are the function's arguments?

- Help documentation in R
- `? function.name`