

# Enseñanza basada en reproducibilidad

## Evaluación de Propiedades Psicométricas

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Curso en: **T**ecnologías **R**eproducibles en la **E**nseñanza de la  
**M**etodología y la **E**stadística



## Objetivo del Curso

Comprender, a través del paquete **ShinyItemAnalysis** y algunas de sus bases de datos, los beneficios de adoptar nuevas tecnologías reproducibles para la enseñanza de contenidos metodológicos y estadísticos.



# Agenda

- 1 Justificación de la herramienta
  - 2 Requerimientos Técnicos
  - 3 ShinyItemAnalysis: Tutorial paso-a-paso
- Referencias



<https://journal.r-project.org/archive/2018/RJ-2018-074/RJ-2018-074.pdf>

## ShinyItemAnalysis for Teaching Psychometrics and to Enforce Routine Analysis of Educational Tests

by *Patrícia Martinková, Adéla Drabinová*

**Abstract** This work introduces **ShinyItemAnalysis**, an R package and an online shiny application for psychometric analysis of educational tests and items. **ShinyItemAnalysis** covers a broad range of psychometric methods and offers data examples, model equations, parameter estimates, interpretation of results, together with a selected R code, and is therefore suitable for teaching psychometric concepts with R. Furthermore, the application aspires to be an easy-to-use tool for analysis of educational tests by allowing the users to upload and analyze their own data and to automatically generate analysis reports in PDF or HTML. We argue that psychometric analysis should be a routine part of test development in order to gather proofs of reliability and validity of the measurement, and we demonstrate how **ShinyItemAnalysis** may help enforce this goal.

(Martinková y Drabinová, 2018)



# Justificación de la Herramienta

*“Las evaluaciones que se utilizan para medir la capacidad o el conocimiento de los estudiantes deben producir puntajes válidos, confiables y justos. Si bien muchos paquetes de R se han desarrollado para cubrir conceptos psicométricos generales (e.g., `psych`, `ltm`) o temas psicométricos específicos (e.g., `diffR`, `lavaan`), las partes interesadas en esta área a menudo no son programadores y por lo tanto, puede resultarle difícil superar la carga inicial de un entorno basado en R. El software disponible comercialmente ofrece una alternativa, pero los altos precios y la metodología limitada pueden ser un problema.”*

(Martinková y Drabinová, 2018, p. 503)



# Requerimientos Técnicos

Para seguir el paso a paso de este tutorial, es necesario que usted haya instalado R y Rstudio en su computador. Acá tiene un video tutorial que le indica cómo hacerlo (<https://youtu.be/Bg2LzHmPZFY>).



# ShinyItemAnalysis

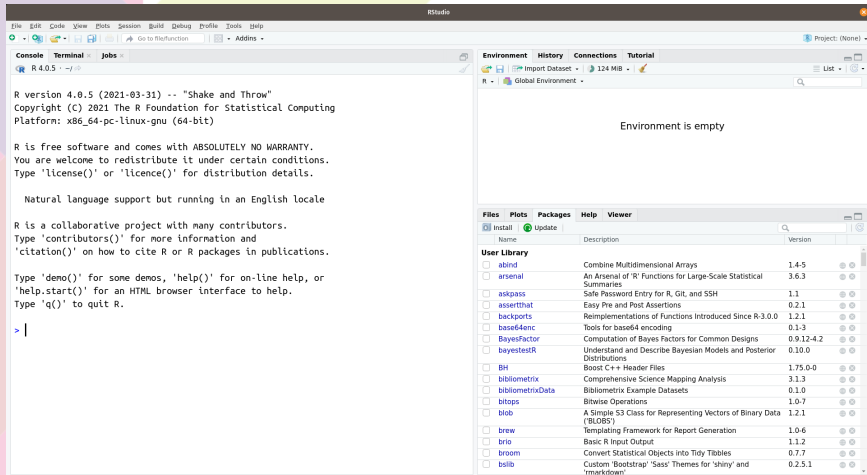
## Tutorial Paso-a-Paso

### (En Rstudio Escritorio)



# ShinyItemAnalysis: Paso 1

## Ingresamos a RStudio



The screenshot shows the RStudio interface with the following components:

- Console:** Displays the R version (4.0.5), copyright information, and a welcome message. It also shows the command prompt with a cursor.
- Environment:** Shows that the environment is empty.
- Packages:** A list of installed and available packages, including 'abind', 'arsenal', 'askpass', 'assertthat', 'backports', 'base64enc', 'BayesFactor', 'bayestestR', 'BH', 'bibliometrix', 'bibliometrixData', 'bitops', 'blob', 'brew', 'brio', 'broom', and 'bslib'.

**Console Output:**

```
R version 4.0.5 (2021-03-31) -- "Shake and Throw"
Copyright (C) 2021 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> |
```

**Environment:** Environment is empty

**Packages:**

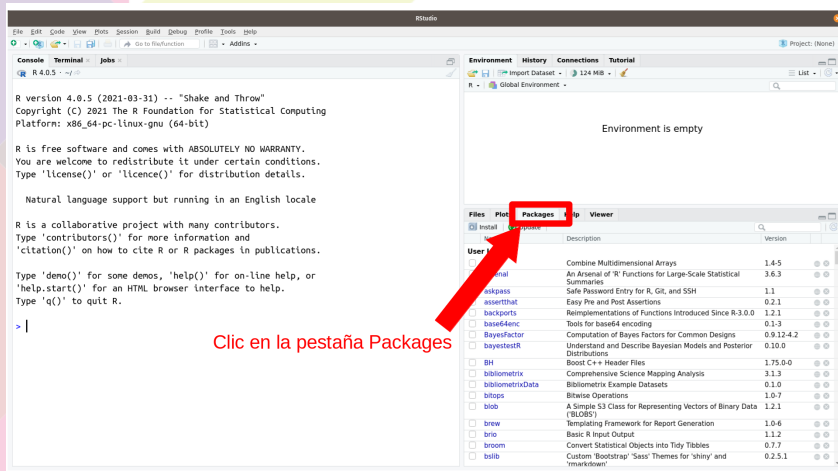
| Name             | Description   | Version    |
|------------------|---|------------|
| abind            | Combine Multidimensional Arrays                                     | 1.4-5      |
| arsenal          | An Arsenal of 'R' Functions for Large-Scale Statistical Summaries   | 3.6.3      |
| askpass          | Safe Password Entry for R, Git, and SSH                             | 1.1        |
| assertthat       | Easy Pre and Post Assertions  | 0.2.1      |
| backports        | Reimplementations of Functions Introduced Since R-3.0.0             | 1.2.1      |
| base64enc        | Tools for base64 encoding   | 0.1-3      |
| BayesFactor      | Computation of Bayes Factors for Common Designs                     | 0.9.12-4.2 |
| bayestestR       | Understand and Describe Bayesian Models and Posterior Distributions | 0.10.0     |
| BH               | Boost C++ Header Files  | 1.75.0-0   |
| bibliometrix     | Comprehensive Science Mapping Analysis                              | 3.1.3      |
| bibliometrixData | Bibliometrix Example Datasets                                       | 0.1.0      |
| bitops           | Bitwise Operations  | 1.0-7      |
| blob             | A Simple S3 Class for Representing Vectors of Binary Data ('BLOBS') | 1.2.1      |
| brew             | Templating Framework for Report Generation                          | 1.0-6      |
| brio             | Basic R Input Output  | 1.1.2      |
| broom            | Convert Statistical Objects into Tidy Tibbles                       | 0.7.7      |
| bslib            | Custom 'Bootstrap' 'Sass' Themes for 'shiny' and 'rmarkdown'        | 0.2.5.1    |





# ShinyItemAnalysis: Paso 2

## Vamos a la pestaña Packages



The screenshot shows the RStudio interface with the 'Packages' tab selected. The console on the left displays the R version 4.0.5 (2021-03-31) and the R Foundation's copyright notice. The 'Environment' pane on the right shows that the environment is empty. The 'Packages' pane on the bottom right lists installed and available packages, including 'User Installed' and 'Base' packages. A red box highlights the 'Packages' tab, and a red arrow points to it from the text 'Clic en la pestaña Packages'.

R version 4.0.5 (2021-03-31) -- "Shake and Throw"  
Copyright (C) 2021 The R Foundation for Statistical Computing  
Platform: x86\_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.

> |

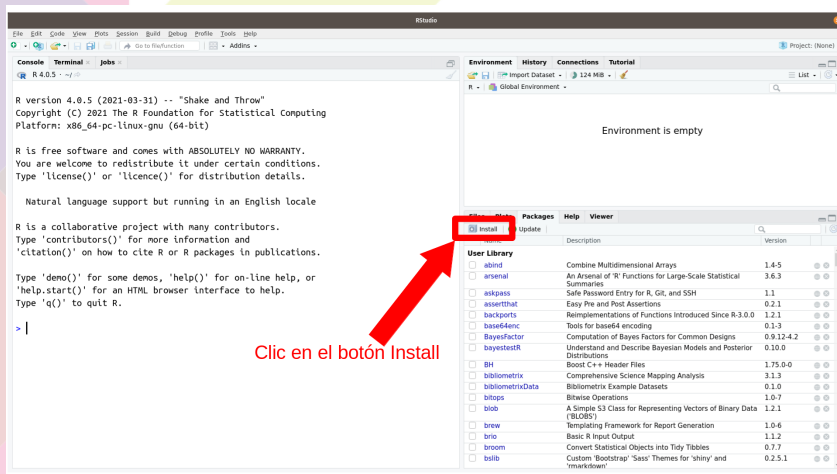
Environment is empty

Click on the Packages tab

| Package          | Description   | Version    |
|------------------|---|------------|
| User Installed   |   |            |
| array            | Combine Multidimensional Arrays                                     | 1.4-5      |
| arsenal          | An Arsenal of R Functions for Large-Scale Statistical Summaries     | 3.6.3      |
| askpass          | Safe Password Entry for R, Git, and SSH                             | 1.1        |
| assertthat       | Easy Pre and Post Assertions  | 0.2.1      |
| backports        | Reimplementations of Functions Introduced Since R-3.0.0             | 1.2.1      |
| base64enc        | Tools for base64 encoding   | 0.1-3      |
| BayesFactor      | Computation of Bayes Factors for Common Designs                     | 0.9.12-4.2 |
| bayestestR       | Understand and Describe Bayesian Models and Posterior Distributions | 0.10.0     |
| BH               | Boost C++ Header Files  | 1.75.0-0   |
| bibliometrix     | Comprehensive Science Mapping Analysis                              | 3.1.3      |
| bibliometrixData | Bibliometrix Example Datasets                                       | 0.1.0      |
| bitops           | Bitwise Operations  | 1.0-7      |
| blob             | A Simple S3 Class for Representing Vectors of Binary Data ('BLOBs') | 1.2.1      |
| brew             | Templating Framework for Report Generation                          | 1.0-6      |
| brio             | Basic R Input Output  | 1.1.2      |
| broom            | Convert Statistical Objects into Tidy Tibbles                       | 0.7.7      |
| bslib            | Custom 'Bootstrap' 'Sass' Themes for 'shiny' and 'rmarkdown'        | 0.2.5.1    |



# ShinyItemAnalysis: Paso 3



The screenshot shows the RStudio interface. The console on the left displays the R version 4.0.5 (2021-03-31) and the 'Shake and Throw' message. The Packages pane on the right shows the 'User Library' with a list of installed and available packages. A red arrow points to the 'Install' button in the Packages pane.

R version 4.0.5 (2021-03-31) -- "Shake and Throw"  
Copyright (c) 2021 The R Foundation for Statistical Computing  
Platform: x86\_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.

> |

Environment is empty

Click en el botón Install

| Package          | Description   | Version    |
|------------------|---|------------|
| abind            | Combine Multidimensional Arrays                                     | 1.4-5      |
| arsenal          | An Arsenal of 'R' Functions for Large-Scale Statistical Summaries   | 3.6.3      |
| askpass          | Safe Password Entry for R, Git, and SSH                             | 1.1        |
| assertthat       | Easy Pre and Post Assertions  | 0.2.1      |
| backports        | Reimplementations of Functions Introduced Since R-3.0.0             | 1.2.1      |
| base64enc        | Tools for base64 encoding   | 0.1-3      |
| BayesFactor      | Computation of Bayes Factors for Common Designs                     | 0.9.12-4.2 |
| bayesTestR       | Understand and Describe Bayesian Models and Posterior Distributions | 0.10.0     |
| BH               | Boost C++ Header Files  | 1.75.0-0   |
| bibliometrix     | Comprehensive Science Mapping Analysis                              | 3.1.3      |
| bibliometrixData | Bibliometrix Example Datasets                                       | 0.1.0      |
| bitops           | Bitwise Operations  | 1.0-7      |
| biob             | A Simple S3 Class for Representing Vectors of Binary Data ('BLOBS') | 1.2.1      |
| brew             | Templating Framework for Report Generation                          | 1.0-6      |
| brio             | Basic R Input Output  | 1.1.2      |
| broom            | Convert Statistical Objects into Tidy Tibbles                       | 0.7.7      |
| bslib            | Custom 'Bootstrap' 'Sass' Themes for 'shiny' and 'rmarkdown'        | 0.2.5.1    |



# ShinyItemAnalysis: Paso 4

The screenshot shows the RStudio interface. The console displays the R version 4.0.5 (2021-03-31) and the platform x86\_64-pc-linux-gnu (64-bit). The Environment pane shows the Global Environment. The Packages pane shows the User Library with various installed packages. A red box highlights the 'Install Packages' dialog box, which is open and shows the 'Install from:' dropdown set to 'Repository (CRAN)'. The 'Packages (separate multiple with space or comma):' field contains 'ShinyItemAnalysis'. A red arrow points from the text 'Escribir ShinyItemAnalysis' to the 'Install Packages' dialog box.

R version 4.0.5 (2021-03-31) -- "Shake and Throw"  
Copyright (C) 2021 The R Foundation for Statistical Computing  
Platform: x86\_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an  
English locale.

R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.

Install Packages

Install from: Repository (CRAN) [Configuring Repositories]

Packages (separate multiple with space or comma):  
ShinyItemAnalysis

Install Cancel

Environment History Connections Tutorial

R 4.0.5 192 MiB

Global Environment

Environment is empty

Files Plots Packages Help Viewer

Install Update

User Library

| Name                                      | Description   | Version    |
|---|---|------------|
| <input type="checkbox"/> abind            | Combine Multidimensional Arrays                                     | 1.4-5      |
| <input type="checkbox"/> arsenal          | An Arsenal of R Functions for Large-Scale Statistical Summaries     | 3.6.3      |
| <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             | 1.2.1      |
| <input type="checkbox"/> base64enc        | Tools for base64 encoding   | 0.1-3      |
| <input type="checkbox"/> BayesFactor      | Computation of Bayes Factors for Common Designs                     | 0.9.12-4.2 |
| <input type="checkbox"/> bayestestR       | Understand and Describe Bayesian Models and Posterior Distributions | 0.10.0     |
| <input type="checkbox"/> BH               | Boost C++ Header Files  | 1.75.0-0   |
| <input type="checkbox"/> bibliometrix     | Comprehensive Science Mapping Analysis                              | 3.1.3      |
| <input type="checkbox"/> bibliometrixData | Bibliometrix Example Datasets                                       | 0.1.0      |
| <input type="checkbox"/> bitops           | Bitwise Operations  | 1.0-7      |
| <input type="checkbox"/> blob             | A Simple S3 Class for Representing Vectors of Binary Data ('BLOBs') | 1.2.1      |
| <input type="checkbox"/> brew             | Templating Framework for Report Generation                          | 1.0-6      |
| <input type="checkbox"/> bris             | Basic R Input Output  | 1.1-2      |
| <input type="checkbox"/> broom            | Convert Statistical Objects into Tidy Tibbles                       | 0.7-7      |
| <input type="checkbox"/> bslib            | Custom 'Bootstrap' 'Saas' Themes for 'shiny' and 'rmarkdown'        | 0.2.5.1    |

Escribir ShinyItemAnalysis



# ShinyItemAnalysis: Paso 5

R version 4.0.5 (2021-03-31) -- "Shake and Throw"  
Copyright (C) 2021 The R Foundation for Statistical Computing  
Platform: x86\_64-pc-linux-gnu (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.

Install Packages

Install from: Configuring Repositories  
Repository (CRAN)

Packages (separate multiple with space or comma):  
ShinyItemAnalysis

Install to Library:  
[home]JuanR@x86\_64-pc-linux-gnu:library4.0 (Default)

☒ Install dependencies

**Install** Cancel

Click en Install

Environment History Connections Tutorial

R v. Global Environment

Environment is empty

Files Plots Packages Help Viewer

Install Update

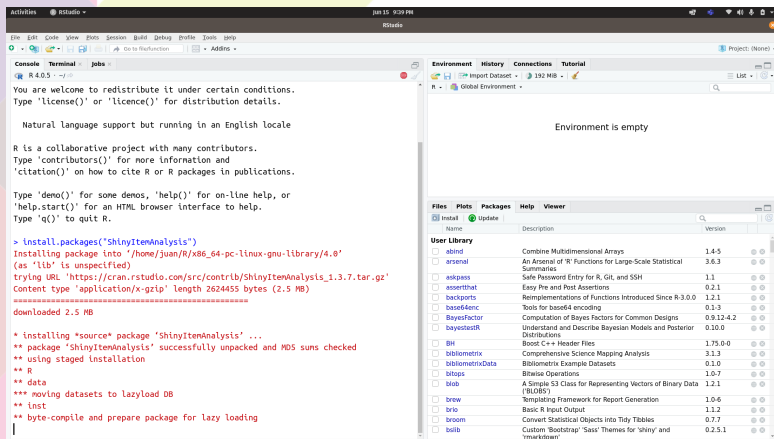
User Library

| Name                                      | Description   | Version    |
|---|---|------------|
| <input type="checkbox"/> abind            | Combine Multidimensional Arrays                                     | 1.4-5      |
| <input type="checkbox"/> arsenal          | An Arsenal of R Functions for Large-Scale Statistical Summaries     | 3.6.3      |
| <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             | 1.2.1      |
| <input type="checkbox"/> base64enc        | Tools for base64 encoding   | 0.1-3      |
| <input type="checkbox"/> BayesFactor      | Computation of Bayes Factors for Common Designs                     | 0.9.12-4.2 |
| <input type="checkbox"/> bayestestR       | Understand and Describe Bayesian Models and Posterior Distributions | 0.10.0     |
| <input type="checkbox"/> BH               | Boost C++ Header Files  | 1.75.0-0   |
| <input type="checkbox"/> bibliometrix     | Comprehensive Science Mapping Analysis                              | 3.1.3      |
| <input type="checkbox"/> bibliometrixData | Bibliometrix Example Datasets                                       | 0.1.0      |
| <input type="checkbox"/> bitops           | Bitwise Operations  | 1.0-7      |
| <input type="checkbox"/> blob             | A Simple S3 Class for Representing Vectors of Binary Data ('BLOBS') | 1.2.1      |
| <input type="checkbox"/> brew             | Templating Framework for Report Generation                          | 1.0-6      |
| <input type="checkbox"/> bris             | Basic R Input Output  | 1.1-2      |
| <input type="checkbox"/> broom            | Convert Statistical Objects into Tidy Tibbles                       | 0.7-7      |
| <input type="checkbox"/> bslib            | Custom 'Bootstrap' 'Saas' Themes for 'shiny' and 'rmarkdown'        | 0.2.5.1    |



# ShinyItemAnalysis: Paso 6

Apariencia de la Console mientras se instala el paquete.



The screenshot shows the RStudio interface with the console window open. The console displays the following output:

```
R 4.0.3 >
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> install.packages("ShinyItemAnalysis")
Installing package into '/home/juan/R/x86_64-pc-linux-gnu-library/4.0'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/src/contrib/ShinyItemAnalysis_1.3.7.tar.gz'
Content type 'application/x-gzip' length 2624455 bytes (2.5 MB)
downloaded 2.5 MB

* installing *source* package 'ShinyItemAnalysis' ...
** package 'ShinyItemAnalysis' successfully unpacked and MD5 sums checked
** using staged installation
** R
** data
*** moving datasets to lazyload DB
** inst
** byte-compile and prepare package for lazy loading
```

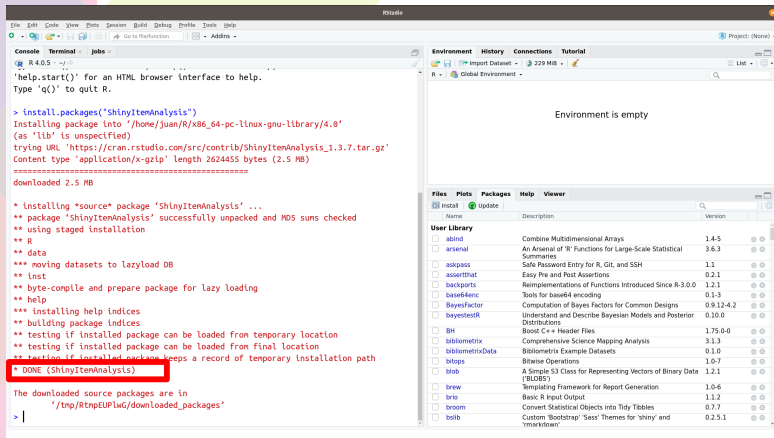
The right-hand pane shows the 'Environment' tab, which is empty, and the 'Packages' tab, which lists installed and available packages.

| Name                                      | Description   | Version    |
|---|---|------------|
| <strong>User Library</strong>             |   |            |
| <input type="checkbox"/> abind            | Combine Multidimensional Arrays                                     | 1.4-5      |
| <input type="checkbox"/> arsenal          | An Arsenal of 'R' Functions for Large-Scale Statistical Summaries   | 3.6.3      |
| <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             | 1.2.1      |
| <input type="checkbox"/> base64enc        | Tools for base64 encoding   | 0.1-3      |
| <input type="checkbox"/> BayesFactor      | Computation of Bayes Factors for Common Designs                     | 0.9.12-4.2 |
| <input type="checkbox"/> bayestestR       | Understand and Describe Bayesian Models and Posterior Distributions | 0.10.0     |
| <input type="checkbox"/> BH               | Boost C++ Header Files  | 1.75.0-0   |
| <input type="checkbox"/> bibliometrix     | Comprehensive Science Mapping Analysis                              | 3.1.3      |
| <input type="checkbox"/> bibliometrixData | Bibliometrix Example Datasets                                       | 0.1.0      |
| <input type="checkbox"/> bitops           | Bitwise Operations  | 1.0-7      |
| <input type="checkbox"/> blob             | A Simple S3 Class for Representing Vectors of Binary Data ('BLOBs') | 1.2.1      |
| <input type="checkbox"/> brew             | Templating Framework for Report Generation                          | 1.0-6      |
| <input type="checkbox"/> brio             | Basic R Input Output  | 1.1.2      |
| <input type="checkbox"/> broom            | Convert Statistical Objects into Tidy Tibbles                       | 0.7.7      |
| <input type="checkbox"/> bslib            | Custom 'Bootstrap' 'Sass' Themes for 'shiny' and 'rmarkdown'        | 0.2.5.1    |



# ShinyItemAnalysis: Paso 7

Apariencia de la Console en Rstudio luego de la instalación exitosa del paquete.



```
R4.0.5 - ~/j...
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> install.packages("ShinyItemAnalysis")
Installing package into '/home/juan/R/x86_64-pc-linux-gnu-library/4.0'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/src/contrib/ShinyItemAnalysis_1.3.7.tar.gz'
Content type 'application/x-gzip' length 2624455 bytes (2.5 MB)
=====
downloaded 2.5 MB

* Installing *source* package 'ShinyItemAnalysis' ...
** package 'ShinyItemAnalysis' successfully unpacked and MD5 sums checked
** using staged installation
** R
** data
*** moving datasets to lazyload DB
** inst
** byte-compile and prepare package for lazy loading
** help
*** installing help indices
** building package indices
** testing if installed package can be loaded from temporary location
** testing if installed package can be loaded from final location
** testing if installed package keeps a record of temporary installation path
* DONE (ShinyItemAnalysis)

The downloaded source packages are in
  '/tmp/RtmpEUPlwG/downloaded_packages'
> |
```

Environment History Connections Tutorial

R v. Global Environment - 229 MB

Environment is empty

Files Plots Packages Help Viewer

| Name                                      | Description   | Version    |
|---|---|------------|
| <b>User Library</b>                       |   |            |
| <input type="checkbox"/> abind            | Combine Multidimensional Arrays                                     | 1.4-5      |
| <input type="checkbox"/> arsenal          | An Arsenal of 'R' Functions for Large-Scale Statistical Summaries   | 3.6.3      |
| <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             | 1.2.1      |
| <input type="checkbox"/> base64enc        | Tools for base64 encoding   | 0.1-3      |
| <input type="checkbox"/> BayesFactor      | Computation of Bayes Factors for Common Designs                     | 0.9.12-4.2 |
| <input type="checkbox"/> bayestestR       | Understand and Describe Bayesian Models and Posterior Distributions | 0.10.0     |
| <input type="checkbox"/> BH               | Boost C++ Header Files  | 1.75.0-0   |
| <input type="checkbox"/> bibliometrix     | Comprehensive Science Mapping Analysis ('BLOBS')                    | 3.1.3      |
| <input type="checkbox"/> bibliometrixData | Bibliometrix Example Datasets                                       | 0.1.0      |
| <input type="checkbox"/> bitops           | Bitwise Operations  | 1.0-7      |
| <input type="checkbox"/> blob             | A Simple S3 Class for Representing Vectors of Binary Data ('BLOBs') | 1.2.1      |
| <input type="checkbox"/> brew             | Templating Framework for Report Generation                          | 1.0-6      |
| <input type="checkbox"/> brio             | Basic R Input Output  | 1.1.2      |
| <input type="checkbox"/> broom            | Convert Statistical Objects into Tidy Tibbles                       | 0.7.7      |
| <input type="checkbox"/> bolb             | Custom 'Bootstrap' 'Sass' Themes for 'shiny' and 'rmarkdown'        | 0.2.5.1    |

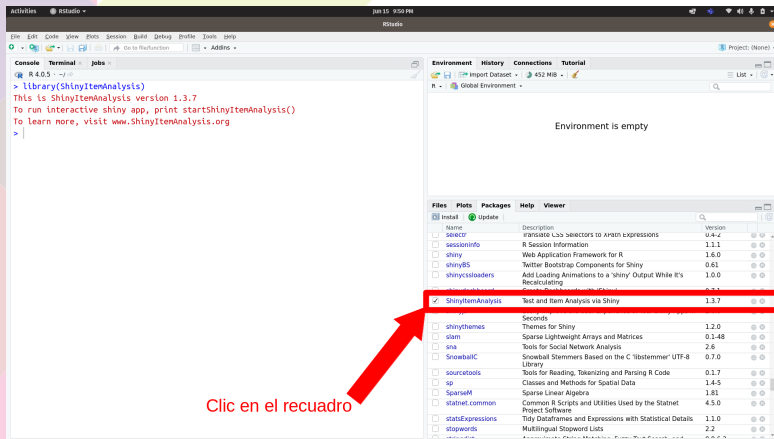
Verifique la presencia del siguiente mensaje en la Console

**\* DONE (ShinyItemAnalysis)**



# ShinyItemAnalysis: Paso 8

Ingresemos a la herramienta ShinyItemAnalysis



Console

```
R 4.0.3 - ~/...  
> library(shinyItemAnalysis)  
This is shinyItemAnalysis version 1.3.7  
To run interactive shiny app, print startShinyItemAnalysis()  
To learn more, visit www.ShinyItemAnalysis.org  
>
```

Environment

Environment is empty

Packages

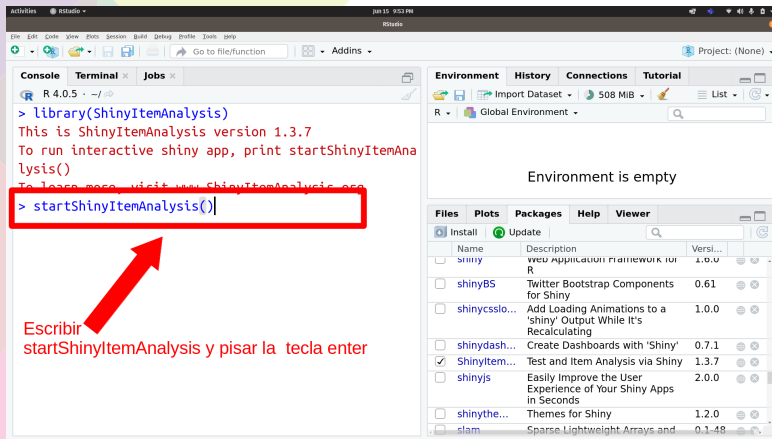
| Name  | Description   | Version |
|---|---|---------|
| <input type="checkbox"/> selectr                      | Translate CSS selectors to XPath expressions                        | 0.4-2   |
| <input type="checkbox"/> sessioninfo                  | R Session Information   | 1.1.1   |
| <input type="checkbox"/> shiny                        | Web Application Framework for R                                     | 1.6.0   |
| <input type="checkbox"/> shinyBS                      | Twitter Bootstrap Components for Shiny                              | 0.61    |
| <input type="checkbox"/> shinycssloaders              | Add Loading Animations to a 'shiny' Output While It's Recalculating | 1.0.0   |
| <input checked="" type="checkbox"/> shinyItemAnalysis | Test and Item Analysis via Shiny                                    | 1.3.7   |
| <input type="checkbox"/> shinythemes                  | Themes for Shiny  | 1.2.0   |
| <input type="checkbox"/> slam                         | Sparse Lightweight Arrays and Matrices                              | 0.1-48  |
| <input type="checkbox"/> sna                          | Tools for Social Network Analysis                                   | 2.6     |
| <input type="checkbox"/> snowballC                    | Snowball Stemmers Based on the C 'libstemmer' UTF-8 Library         | 0.7.0   |
| <input type="checkbox"/> sourcetools                  | Tools for Reading, Tokenizing and Parsing R Code                    | 0.1.7   |
| <input type="checkbox"/> sp                           | Classes and Methods for Spatial Data                                | 1.4-5   |
| <input type="checkbox"/> SparseM                      | Sparse Linear Algebra   | 1.81    |
| <input type="checkbox"/> statnet.common               | Common R Scripts and Utilities Used by the Statnet Project Software | 4.5.0   |
| <input type="checkbox"/> statsExpressions             | Tidy Dataframes and Expressions with Statistical Details            | 1.1.0   |
| <input type="checkbox"/> stopwords                    | Multilingual Stopword Lists   | 2.2     |

Clic en el recuadro



# ShinyItemAnalysis: Paso 9

Vamos a ingresar a la herramienta ShinyItemAnalysis escribiendo el código `startShinyItemAnalysis`



The screenshot shows the RStudio interface. The console pane on the left displays the following text:

```
> library(ShinyItemAnalysis)
This is ShinyItemAnalysis version 1.3.7
To run interactive shiny app, print startShinyItemAnalysis()
To learn more, visit www.ShinyItemAnalysis.org
> startShinyItemAnalysis()
```

The last line of code, `startShinyItemAnalysis()`, is enclosed in a red rectangular box. A red arrow points from the text "Escribir startShinyItemAnalysis y pisar la tecla enter" (Write startShinyItemAnalysis and press the enter key) to the red box.

The environment pane on the right shows "Environment is empty". The packages pane at the bottom shows a list of installed and available packages, including Shiny, shinyBS, shinycsslo..., shinydash..., ShinyItem..., shinyjs, shinythe..., and slam.

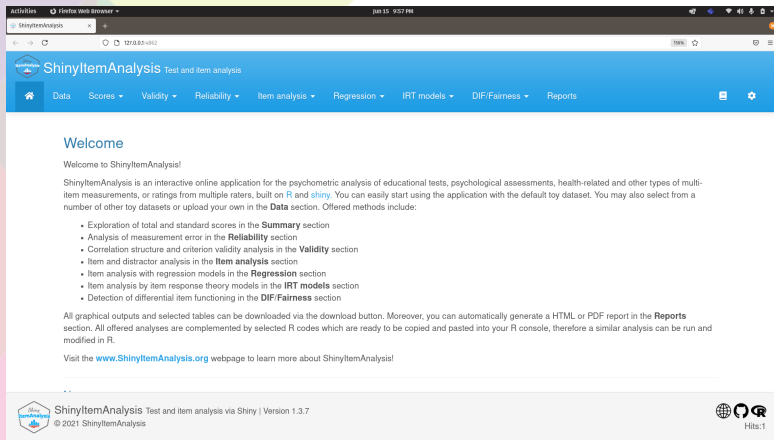
Escribir  
startShinyItemAnalysis y pisar la tecla enter





# ShinyItemAnalysis: Paso 10

## Apariencia de la herramienta ShinyItemAnalysis dentro de su navegador de Internet



# ShinyItemAnalysis: Paso 11

Seleccione los datos disponibles y explore las opciones disponibles en los menues “Validity”, “Reliability”, “Item Analysis”, “Regression”, “IRT Models”, “DIF/Fairness” y “Reports”.

ShinyItemAnalysis Test and item analysis

Data Scores Validity Reliability Item analysis Regression IRT models DIF/Fairness Reports

Data Basic summary Data exploration

### Data

For demonstration purposes, the 20-item dataset **GMAT** is used. While on this page, you may select one of several other toy datasets or you may upload your own dataset (see below). To return to the demonstration dataset, click on the **Upload data** button.

### Training datasets

Select dataset

GMAT

**GMAT** (Martinkova et al., 2017) is a generated dataset based on the parameters of a real Graduate Management Admission Test (GMAT; Kingston et al., 1985) from the **difNLTK** package. This dataset represents the responses of 2,000 subjects (1,000 males coded as '0', 1,000 females coded as '1') to a multiple-choice test of 20 items. It also contains generated continuous criterion intended to be predicted by the test. As discussed in Martinkova et al. (2017), the dataset was simulated in order to provide an example of DIF items present even in the case of identical total score distributions. To replicate the example provided in Martinkova et al. (2017), select the **GMAT** dataset and go to **DIF/Fairness** section.

### Upload your own datasets

Here you can upload your own dataset. Select all necessary files and use the **Upload data** button on bottom of this page.

ShinyItemAnalysis Test and item analysis via Shiny | Version 1.3.7  
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Hits:1

Martinková, P., y Drabinová, A. (2018). ShinyItemAnalysis for Teaching Psychometrics and to Enforce Routine Analysis of Educational Tests. *The R Journal*, 10(2), 503–515. doi: 10.32614/RJ-2018-074

