Manual de Construcción de Índices Compuestos

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Contents

Chapter 1

Introducción

El *Manual de Construcción de Índices Compuestos* es una guía para el desarrollo de índices que combinan múltiples indicadores. Este documento detalla métodos y prácticas para esclarecer la construcción de índices compuestos, con un enfoque en la mejora de técnicas estadísticas.

Centrándose en brindar recomendaciones prácticas, el manual se sirve de R como herramienta analítica, estructurando cada etapa del proceso de desarrollo para promover la transparencia y reducir el riesgo de malinterpretación de los datos.

Los elementos en la construcción de índices compuestos, según se detallan en el manual, incluyen:

Imputación de datos faltantes: Se examinan estrategias para abordar la falta de datos completos.

Análisis multivariado: Se realiza un análisis para entender la estructura de los datos y justificar las decisiones de ponderación y agregación, prestando atención a la colinealidad.

Normalización: Se describen métodos para hacer que los indicadores sean comparables.

Ponderación y agregación: Se discute cómo unir los indicadores siguiendo un marco teórico establecido.

Robustez y sensibilidad: Se realizan pruebas de robustez considerando diversos factores como la normalización y la selección de ponderaciones.

Vínculos con otras variables: Se exploran correlaciones con otros indicadores y se analizan las conexiones a través de regresiones.

Visualización: Se tratan diferentes maneras de presentar los índices y su impacto en la interpretación.

Para ilustrar estos conceptos de forma práctica, el manual incorpora un caso de estudio ficticio, el Índice de Democracia en Star Trek (IST), seleccionado por su estructura simple y el enfoque en la dimensión electoral de la democracia, tal como se define en el proyecto V-Dem.

El IST incluye indicadores clave para garantizar que las y los gobernantes rindan cuentas la ciudadanía, lo que se logra a través de competencias electorales justas bajo condiciones de sufragio amplio, libertad para las organizaciones políticas y civiles, elecciones limpias sin fraudes sistemáticos y con resultados electorales que influencian la composición del liderazgo ejecutivo. Además, la libertad de expresión y la presencia de medios independientes que ofrecen perspectivas alternativas en temas políticos [**?**]. Para una descripción detallada de cada indicador, ver Cuadro 1.

Cuadro 1: Indicadores del IST

- **Libertad de asociación:** Este indicador evalúa la libertad de asociación, incluyendo si los grupos de interés pueden formarse y operar libremente.
- **Elecciones limpias:** Mide el grado de libertad y justicia en las elecciones nacionales.
- **Libertad de expresión:** Evalúa la libertad de expresión y la presencia de medios de comunicación alternativos e independientes.
- **Funcionarios electos:** Considera en qué medida los líderes son elegidos a través de elecciones periódicas y libres.
- **Sufragio:** Se refiere al sufragio universal y si todos los adultos tienen derecho al voto.

1.1 Render book

You can render the HTML version of this example book without changing anything:

1. Find the **Build** pane in the RStudio IDE, and
2. Click on **Build Book**, then select your output format, or select "All formats" if you'd like to use multiple formats from the same book source files.

Or build the book from the R console:

```
bookdown::render_book()
```

To render this example to PDF as a `bookdown::pdf_book`, you'll need to install XeLaTeX. You are recommended to install TinyTeX (which includes XeLaTeX): https://yihui.org/tinytex/.

1.2 Preview book

As you work, you may start a local server to live preview this HTML book. This preview will update as you edit the book when you save individual .Rmd files. You can start the server in a work session by using the RStudio add-in "Preview book", or from the R console:

```
bookdown::serve_book()
```

Chapter 2

Hello bookdown

All chapters start with a first-level heading followed by your chapter title, like the line above. There should be only one first-level heading (`#`) per .Rmd file.

2.1 A section

All chapter sections start with a second-level (`##`) or higher heading followed by your section title, like the sections above and below here. You can have as many as you want within a chapter.

An unnumbered section

Chapters and sections are numbered by default. To un-number a heading, add a `{.unnumbered}` or the shorter `{-}` at the end of the heading, like in this section.

Chapter 3

Cross-references

Cross-references make it easier for your readers to find and link to elements in your book.

3.1 Chapters and sub-chapters

There are two steps to cross-reference any heading:

1. Label the heading: `# Hello world {#nice-label}`.
    - Leave the label off if you like the automated heading generated based on your heading title: for example, `# Hello world` = `# Hello world {#hello-world}`.
    - To label an un-numbered heading, use: `# Hello world {-#nice-label}` or `{# Hello world .unnumbered}`.
2. Next, reference the labeled heading anywhere in the text using `\@ref(nice-label)`; for example, please see Chapter 3.
    - If you prefer text as the link instead of a numbered reference use: any text you want can go here.

3.2 Captioned figures and tables

Figures and tables *with captions* can also be cross-referenced from elsewhere in your book using `\@ref(fig:chunk-label)` and `\@ref(tab:chunk-label)`, respectively.

See Figure 3.1.

```
par(mar = c(4, 4, .1, .1))
plot(pressure, type = 'b', pch = 19)
```

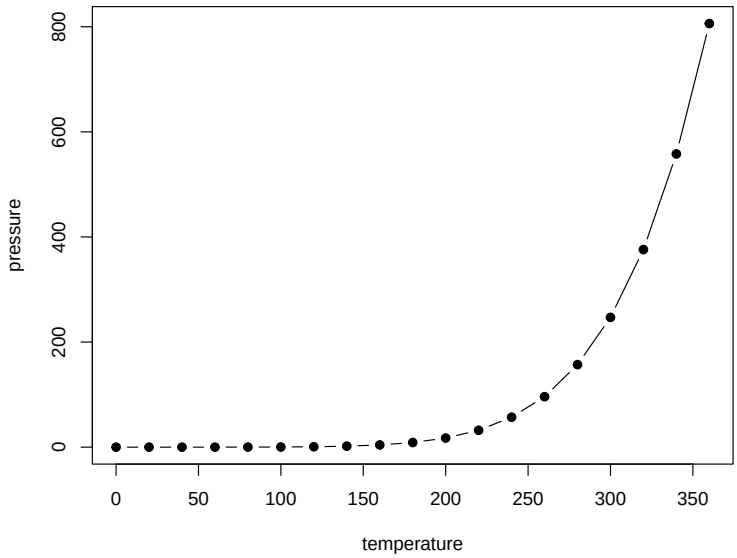

Figure 3.1: Here is a nice figure!

Don't miss Table 3.1.

```
knitr::kable(
  head(pressure, 10), caption = 'Here is a nice table!',
  booktabs = TRUE
)
```

Table 3.1: Here is a nice table!

temperature	pressure
0	0.0002
20	0.0012
40	0.0060
60	0.0300
80	0.0900
100	0.2700
120	0.7500
140	1.8500
160	4.2000
180	8.8000

Chapter 4

Parts

You can add parts to organize one or more book chapters together. Parts can be inserted at the top of an .Rmd file, before the first-level chapter heading in that same file.

Add a numbered part: `# (PART) Act one {-}` (followed by `# A chapter`)

Add an unnumbered part: `# (PART\*) Act one {-}` (followed by `# A chapter`)

Add an appendix as a special kind of un-numbered part: `# (APPENDIX) Other stuff {-}` (followed by `# A chapter`). Chapters in an appendix are prepended with letters instead of numbers.

Chapter 5

Footnotes and citations

5.1 Footnotes

Footnotes are put inside the square brackets after a caret `^[]`. Like this one [1].

5.2 Citations

Reference items in your bibliography file(s) using `@key`.

For example, we are using the **bookdown** package [Xie, 2023] (check out the last code chunk in index.Rmd to see how this citation key was added) in this sample book, which was built on top of R Markdown and **knitr** [Xie, 2015] (this citation was added manually in an external file book.bib). Note that the `.bib` files need to be listed in the index.Rmd with the YAML `bibliography` key.

The RStudio Visual Markdown Editor can also make it easier to insert citations: https://rstudio.github.io/visual-markdown-editing/#/citations

[1] This is a footnote.

Chapter 6

Blocks

6.1 Equations

Here is an equation.

$$f(k) = \binom{n}{k} p^k (1-p)^{n-k} \tag{6.1}$$

You may refer to using `\@ref(eq:binom)`, like see Equation (6.1).

6.2 Theorems and proofs

Labeled theorems can be referenced in text using `\@ref(thm:tri)`, for example, check out this smart theorem 6.1.

Theorem 6.1. *For a right triangle, if c denotes the* length *of the hypotenuse and a and b denote the lengths of the* ***other*** *two sides, we have*

$$a^2 + b^2 = c^2$$

Read more here https://bookdown.org/yihui/bookdown/markdown-extensions-by-bookdown.html.

6.3 Callout blocks

The R Markdown Cookbook provides more help on how to use custom blocks to design your own callouts: https://bookdown.org/yihui/rmarkdown-cookbook/custom-blocks.html

Chapter 7

Sharing your book

7.1 Publishing

HTML books can be published online, see: https://bookdown.org/yihui/bookdown/publishing.html

7.2 404 pages

By default, users will be directed to a 404 page if they try to access a webpage that cannot be found. If you'd like to customize your 404 page instead of using the default, you may add either a `_404.Rmd` or `_404.md` file to your project root and use code and/or Markdown syntax.

7.3 Metadata for sharing

Bookdown HTML books will provide HTML metadata for social sharing on platforms like Twitter, Facebook, and LinkedIn, using information you provide in the `index.Rmd` YAML. To setup, set the `url` for your book and the path to your `cover-image` file. Your book's `title` and `description` are also used.

This `gitbook` uses the same social sharing data across all chapters in your book- all links shared will look the same.

Specify your book's source repository on GitHub using the `edit` key under the configuration options in the `_output.yml` file, which allows users to suggest an edit by linking to a chapter's source file.

Read more about the features of this output format here:

https://pkgs.rstudio.com/bookdown/reference/gitbook.html

Or use:

```
?bookdown::gitbook
```

Bibliography

Yihui Xie. *Dynamic Documents with R and knitr*. Chapman and Hall/CRC, Boca Raton, Florida, 2nd edition, 2015. URL http://yihui.org/knitr/. ISBN 978-1498716963.

Yihui Xie. *bookdown: Authoring Books and Technical Documents with R Markdown*, 2023. URL https://github.com/rstudio/bookdown. R package version 0.36.