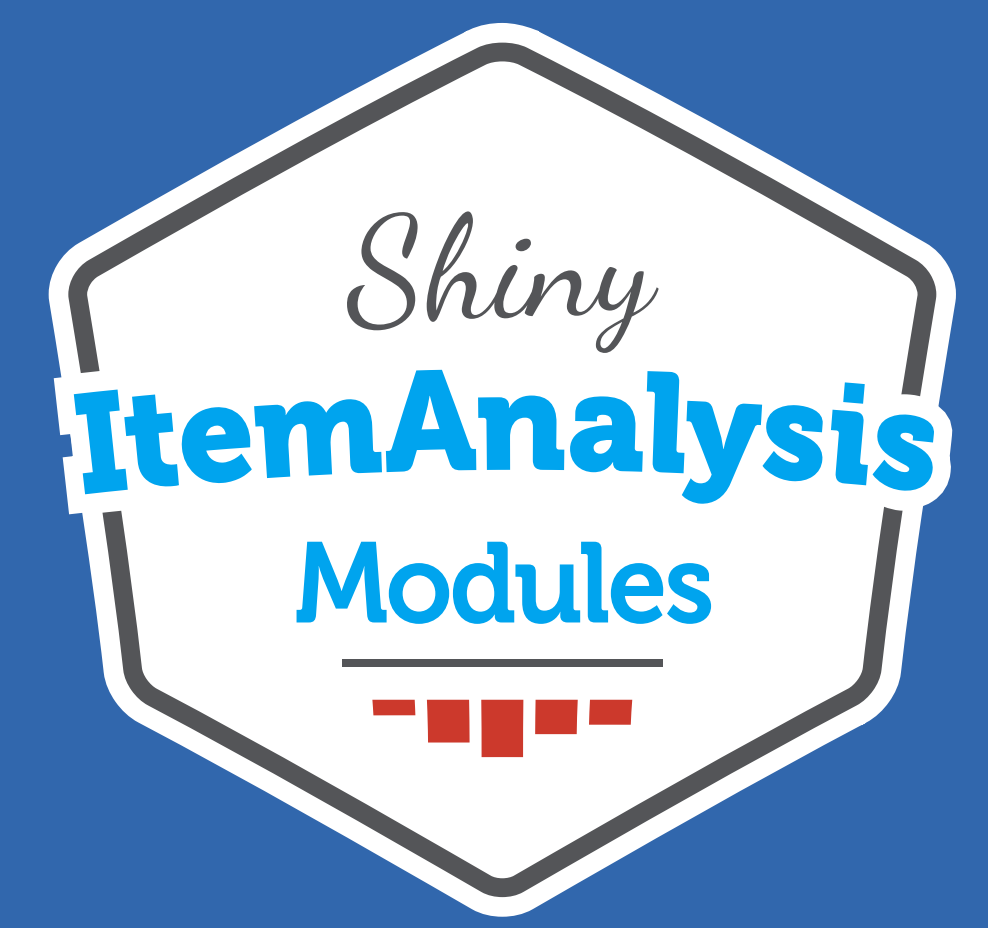


Turn your psychometrics interactive with {ShinyItemAnalysis} modules



Enhancing Psychometrics with Interactive ShinyItemAnalysis Modules

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INTRODUCTION

- {ShinyItemAnalysis} (SIA¹) is an R package and a {shiny} web application that provides various psychometric analyses. It was developed to enhance the learning of psychometric concepts, showcase contemporary research, and streamline routine psychometric work.
- As the field expands, numerous methods have emerged. Yet, many novel methods lack interactive implementation or didactic demonstration.
- To address this gap, we introduce “SIA modules” – an add-on extension feature that enables anyone to build on top of the rich SIA infrastructure (incl. data uploading and processing), substantially alleviating the development.

METHODS AND MATERIALS

- A SIA module consists of a server logic and UI function pair, forming an ordinary {shiny} module. Both functions reside in R/ directory of a package and are a regular part of its namespace.
- The function bindings, title, and category of a SIA module are then described in a YAML file located in the package’s inst/ directory.
- If a package declares in its DESCRIPTION that it contains SIA modules, then SIA reads the YAML, the package is loaded and attached, and the modules are plugged into the app’s sections according to their category.

EXAMPLE MODULES

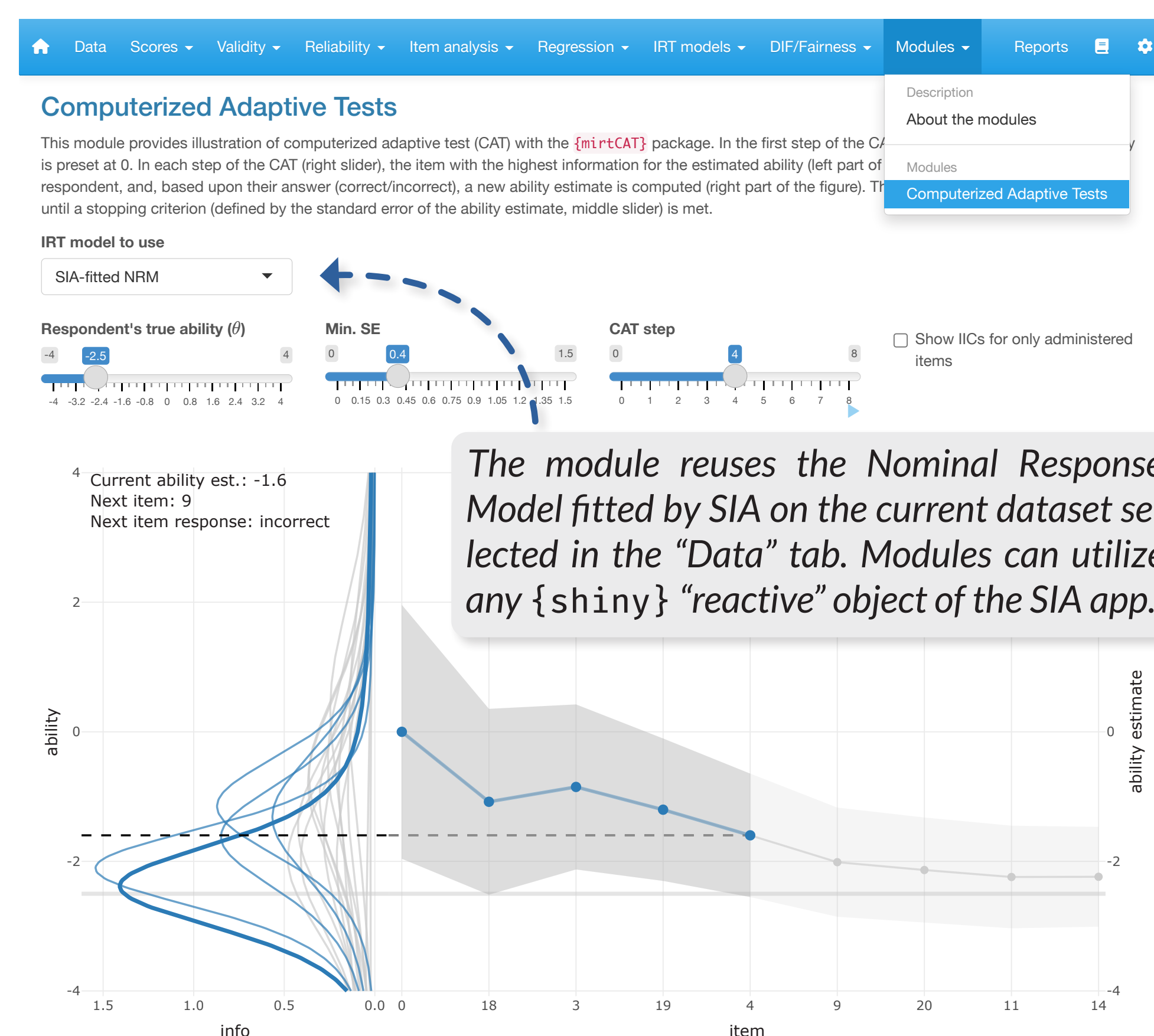
- In the R package {SIAModules}² we provide several examples, including:

REFERENCES

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2. Martinkov P., & Netk, J. (2023). *SIAModules: Modules for ‘ShinyItemAnalysis’*. R package version 0.1.0. <https://CRAN.R-project.org/package=SIAModules>
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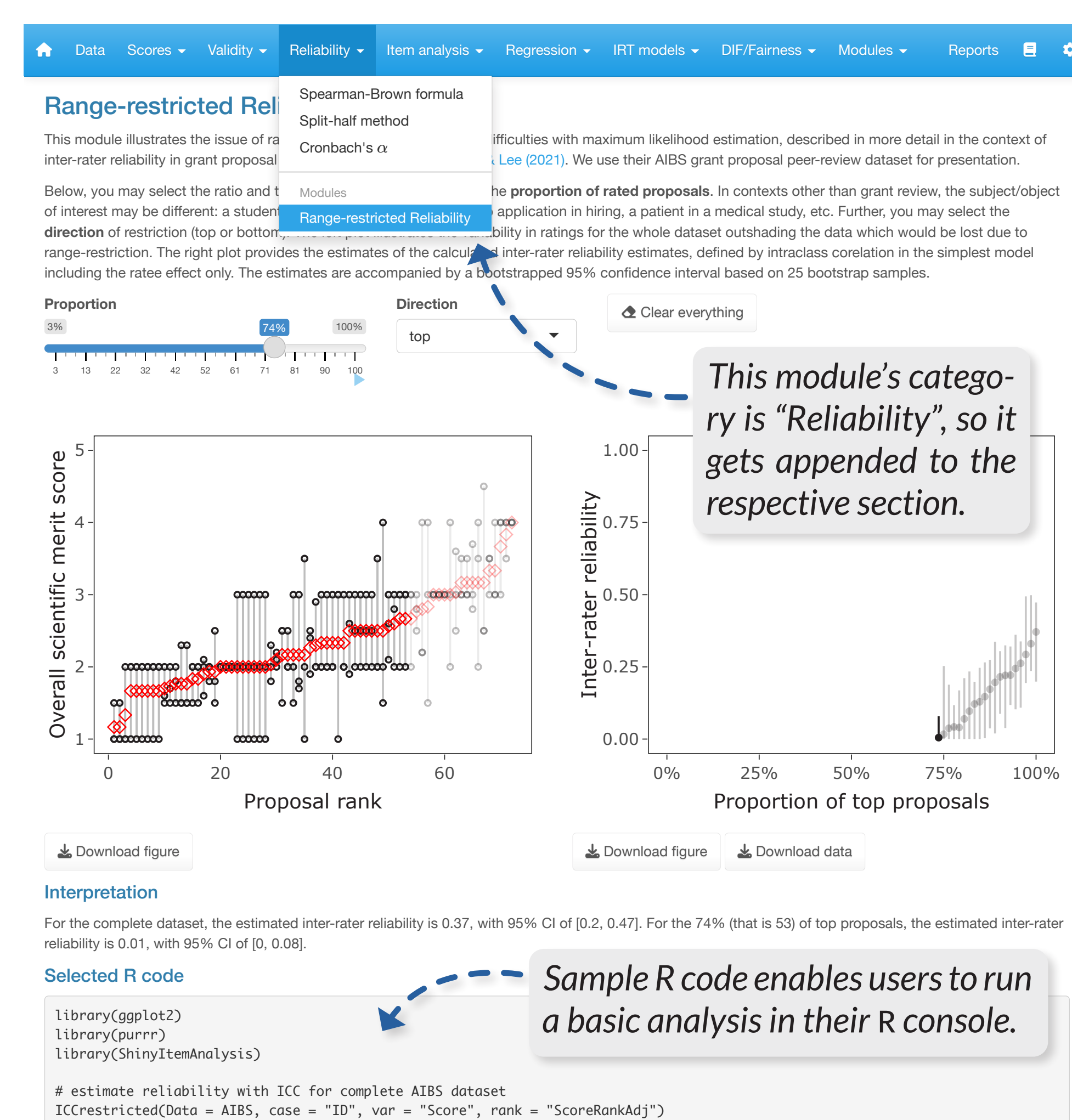
Computerized Adaptive Tests

- A didactic on adaptive ability estimation, based on a model either *fitted by SIA using current data*, or an example model provided by the module itself.



Range-restricted Reliability

- A demonstration of the difficulties in estimating inter-rater reliability in restricted samples³.
- Extends SIA to handle *continuous data from multiple raters* and adheres to the recommended module structure by including sample R code, references etc.

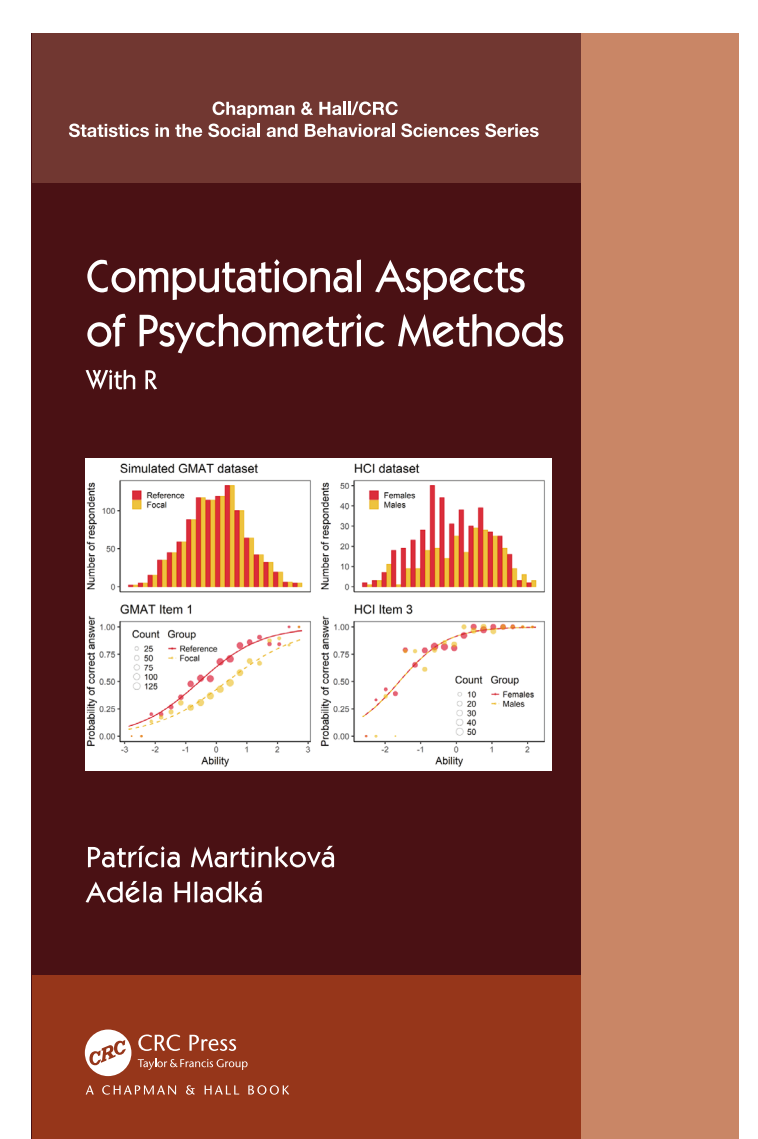


ADD YOUR OWN MODULE

- The {SIAtools} package assists in managing SIA modules and helps avoid common pitfalls during module creation.
- `create_module_project()` sets up a new package with the complete infrastructure needed for the modules.
- `add_module()` creates an .R file for a module with a pre-filled template and adds an entry to the YAML.
- `preview_module()` runs the module in a standalone development environment.

DISCUSSION

- Interactive presentations can help promote new concepts and methods in psychometric research, making them accessible to a wider range of users.
- SIA modules enables researchers and lecturers to easily create their own demonstrations, leveraging the infrastructure of the SIA app.
- For more details on {ShinyItemAnalysis} and how SIA and SIA modules can assist in promoting psychometric methods and research, please refer to the book⁴.



See the app with all {SIAModules} in action at shiny.cs.cas.cz/ShinyItemAnalysis