jsPsychR manual

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2022-08-28T00:00:00+01:00

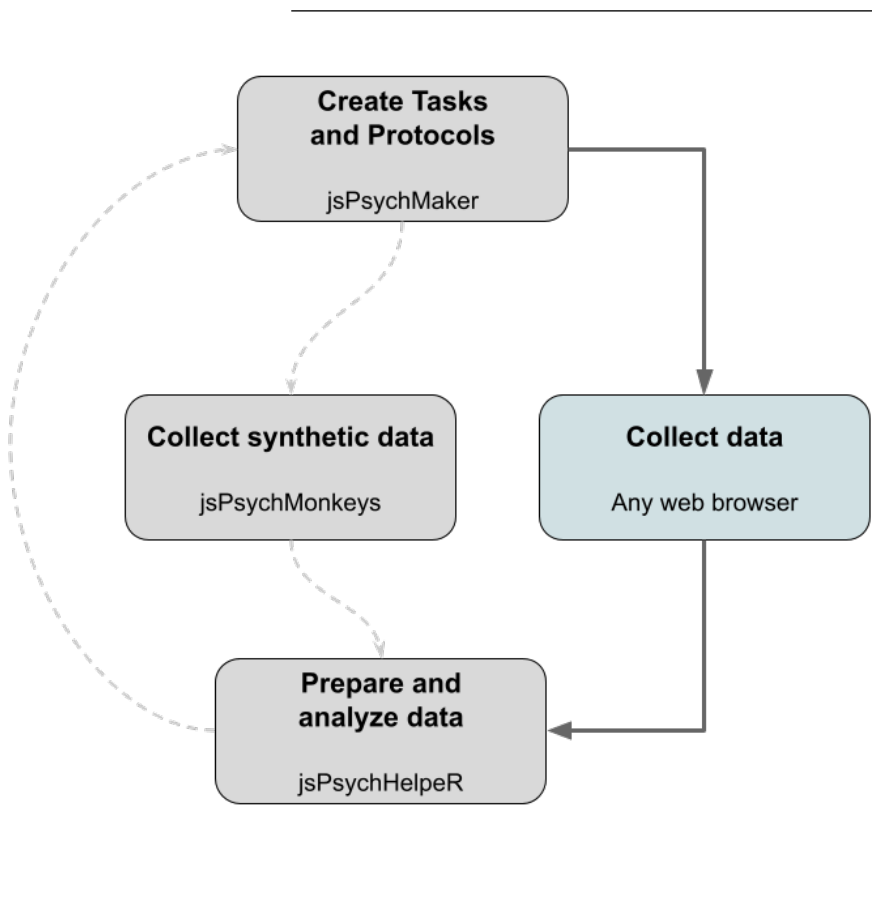# Table of contents

What is jsPsychR?

`jsPsychR` is a group of **open source** tools to help create experimental paradigms with jsPsych, simulate participants and standardize the data preparation and analysis.

We have three main tools:

- jsPsychMaker: Create experiments with jsPsych, randomize participants balance between conditions, etc.

- **jsPsychMonkeys**: Release monkeys to a jsPsych experiment using the R package {targets}, docker and {RSelenium}
- **jsPsychHelpeR**: Standardize and automatize data preparation and analysis of jsPsych experiments created with jsPsychMaker

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1 Reproducible experiments

We use different technologies to develop experiments. Some examples are Psychopy, Qualtrics, Limesurvey, jsPsych, Gorilla, etc. Each of these has advantages and disadvantages and, in general, there are pragmatic aspects to take into account when adopting one or the other: cost, type of experiment (EEG or behavioral, lab or online), lab history and available resources, …

We opted for jsPsych to run behavioral experiments because it is an **open source** javascript library, based on standard web technologies, and can be used online and offline.

In the last years, we started working on a set of tools to create jsPsych experiments (jsPsychMaker), simulate participants (jspsychMonkeys) and standardize and automatize the data preparation and analysis (jsPsychHelpeR).

Our final goal is to have a big catalog of tasks available to use in the jsPsychMaker repo. Each of the tasks should run with jspsychMonkeys to create virtual participants. And each task will have a sister script in jsPsychHelpeR to fully automate data preparation.

1.1 Open and reproducible pipeline

To replicate an experiment from a publication is not trivial. One of the main goals of this sytem is to be able to create, share and reproduce an experiment, its data, and data preparation and analysis without any extra effort.

Furthermore, all the components of the pipeline should be Open Source, which allows reviewers, collaborators, etc. to check and run the code. This also makes it accessible to anyone with a computer and access to the internet, eliminating cost constrains.

With this system you can create a paradigm, simulate data and prepare data and analysis almost automatically (including anonimization).

The system output is standardized, so names of variables and the structure of the data are predictable. Finally, the plots, tables, reports and analysis are reproducible, so you can get enerything ready with simulated data, preregister or even better, go for a registered report and just relaunch the data preparation and analysis when the participant's data arrive, with a single command.

1.2 Automatization

We tried to make a few basic things right, but this is an evolving project, and some things are more complex than one would want. Please do report the issues you find:

- jsPsychMaker issues
- jsPsychMonkeys issues
- jsPsychHelpeR issues

Figure 1.1: SOURCE: https://xkcd.com/1425/

2 Quick Guide

2.1 jsPsychMaker: Create an experimental protocol

See the jsPsychMaker chapter for more detailed instructions.

Outline

1) Download jsPsychMaker

2) Go to the folder `canonical_protocols` and edit the `config.js` file to select the tasks you need

3) Open `index.html` in your browser

---

1) Download jsPsychMaker

Open RStudio and run the following two lines in the console. This will download the last stable jsPsychMaker version `v0.2.0`. When you finish, a new RStudio project named jsPsychMaker-0.0.2 will open.

```
# Make sure you have {usethis} installed
if (!require('usethis')) install.packages('usethis'); library('usethis')

# Download the last version:
usethis::use_course(url = "gorkang/jsPsychMaker", destdir = "~/Downloads/")
```

2) Edit configuration

You will need to edit the config.js file on the `canonical_protocols`. See the experiment configuration section for more details.
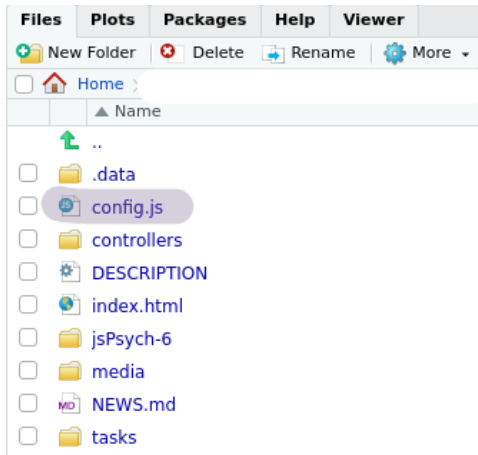
You can do one of the following:

A) Go to folder `canonical_protocols` and edit `config.js`.

B) Use the jsPsychMaker_config Shiny APP and copy the generated config.js file in the `canonical_protocols` folder.

3) Run experiment

The experiment is ready to run on your computer. Open `index.html` in Google Chrome or your favorite (and up to date) browser.

2.2 jsPsychMonkeys: Simulate participants

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See the jsPsychMonkeys chapter for more detailed instructions.

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jsPsychMonkeys uses Selenium inside a Docker container to guarantee each session is a clean session. On Linux it's use and configuration is trivial, but on Windows it can be trickier.

Outline

1) Download jsPsychMonkeys

2) Setup

3) Run Monkeys

---

1) Download jsPsychMonkeys

```r
if (!require('usethis')) install.packages('usethis'); library('usethis')

usethis::use_course(url = "gorkang/jsPsychMonkeys", destdir = "~/Downloads/")
```

2) Setup

Run setup: `source("setup.R")`. This will install the packages needed.

Ubuntu

You may need to install some system libraries first:

- `sudo apt install libssl-dev libcurl4-openssl-dev libxml2-dev docker`

3) Run Monkeys

Open `run.R` and follow the instructions. Mainly:

- Open `_targets.R` file: `rstudioapi::navigateToFile("_targets.R")`

- Edit `parameters_monkeys_minimal`. For example, launch participants 1 to 5 to the 999 protocol locally:

    - `parameters_monkeys_minimal = list(uid = 1:5, local_folder_tasks = "Downloads/999")`

- Run Monkeys!: `targets::tar_make()`

2.3 jsPsychHelpeR: Prepare data

See the **jsPsychHelpeR chapter** for more detailed instructions.
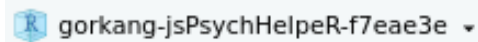
Outline

1) Download jsPsychHelpeR

2) Run setup

3) Run data preparation

---

1) Download jsPsychHelpeR

- Run the following two lines in a RStudio console. A new RStudio session will appear. On the top right corner of your RStudio you should see something similar to:



```
# Make sure you have {usethis} installed
if (!require('usethis')) install.packages('usethis'); library('usethis')

# Download jsPsychHelpeR version to the Downloads folder
usethis::use_course(url = "gorkang/jsPsychHelpeR", destdir = "~/Downloads/")
```

2) Run setup

Open the file `run.R` and run initial setup:
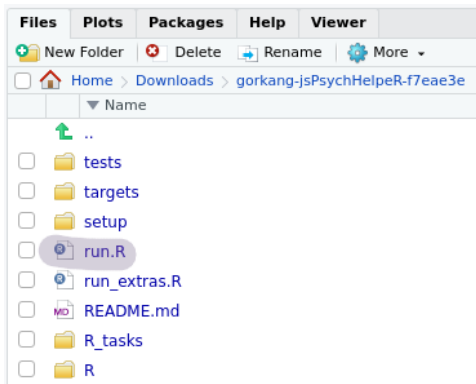
```
# Load functions
invisible(lapply(list.files("./R", full.names = TRUE, pattern = ".R$"), source))

# Run initial setup [REMEMBER to replace `999` with your project number]
run_initial_setup(pid = 999)
```

`run_initial_setup()` will:

- Delete old files

- Install dependencies

- Create necessary folders

- Download results files for the project (you will need the FTP credentials)

- Download and zip a copy of the full protocol without the data (you will need the FTP credentials)

- Create a `_targets.R` file for your project

IMPORTANT: You may need to manually copy the results files to the folder `data/PROJECT ID`

3) Run data preparation

```
# Run data preparation
targets::tar_make()
```

If you are curious, running `targets::tar_visnetwork(targets_only = TRUE)` will show the whole data preparation targets tree.

3 jsPsychMaker

jsPsychMaker: Create experiments with jsPsych, randomize participants, etc.

Using jsPsychMaker to build experimental protocols helps you with a few things:

- Create full protocols using tasks already implemented by just editing a config.js file

  - You can also use the jsPsychMaker Shiny APP to create your config.js file

- Select order of tasks, randomize subsets of tasks, etc.
- Randomize participants to groups making sure the balance between the groups is maintained
- Allow participants to continue in the task where they left in the protocol
- Set time limits to complete the protocol

  - Automatically discard participants over the time limit, freeing the slots for new participants

- Seamlessly select between online and offline protocols
- Simulate participants with jsPsychMonkeys
- *Automagically* get your data prepared with jsPsychHelpeR

See QuickGuide for basic instructions.

3.1 Available tasks

In 2022-08-28 we have 58 tasks implemented, and 31 in development. The full details about the available tasks can be checked in this document. You can always check the full list of tasks in the Github repo.

If you need help creating a NEW task, see the section help creating a new task.

Below, a table with an overview of the available tasks:

Table 3.1: Test

short_name	Nombre	Descripcion
AIM	Grupos Socieeconómicos	Modelo que permite segmentar y clasificar socioeconómicamente a los individuos.
Bank	Detalles bancarios	Detalles bancarios para realizar transferencia a participante por su participación en experimento
BART	Balloon Analogue Risk Task	Medida de riesgo individual mediante el análisis de las condultas del individuo
BNT	Berlin Numeracy test	Breve, flexible y de fácil aplicación. Mide habilidades numéricas
bRCOPE	Escala de afrontamiento religioso Brief-RCOPE	Evalúa dos patrones de afrontamiento religioso en población adolescente y adulta
CAS	COVID-19 anxiety scale	Evalúa las fluctuaciones en los niveles de ansiedad causados por COVID-19
Consent	Consentimiento Informado de Participación	Consentimiento informado estandar
ConsentHTML	Consentimiento Informado de Participación	Consentimiento informado estandar
Cov19Q	Cuestionario Covid 19	Evalúa dimensiones relacionadas al covid-19
COVIDCONTROL	Covid related Questions	Busca conocer los cambios que han ocurrido en la vida del entrevistado desde la aparición del COVID-19.
CRS	The Centrality of Religiosity Scale	Mide la intensidad general de cinco dimensiones básicas de la religiosidad.

Table 3.1: Test *(continued)*

short_name	Nombre	Descripcion
CRT7	Cognitive reflection test	Mide la tendencia a anular una alternativa de respuesta prepotente que es incorrecta y participar en una reflexión adicional que conduce a la respuesta correcta.
CRTMCQ4	Cognitive reflection test - 4 alternatives	Mide la tendencia a anular una alternativa de respuesta prepotente que es incorrecta y participar en una reflexión adicional que conduce a la respuesta correcta.
CRTv	Verbal Cognitive Reflection Test	Mide la capacidad de suprimir una intuición inicial (incorrecta) y reflexionar cognitivamente.
DASS21	Escalas de depresión ansiedad y estrés	Mide escala de ansiedad, estrés y depresión (autoinforme)
DEBRIEF	Debrief at end of experiment	Informe presentado al final del experimento
DEMOGR	Demographic scale	Ejemplo de tarea donde se recoje información demográfica del encuestado
EAR	Escala de Autoestima de Rosenberg	Instrumento unidimensional que mide la autoestima.
EmpaTom	Empatia, Teoria de la mente y Compasión	Tarea de video social que permite la manipulación y evaluación independiente de la empatía y compasión
ERQ	Emotion Regulation Questionnaire	Evalua dos estrategias de regulación emocional (autoinforme)
ESM	Escala Subjetiva de Memoria	Evalúa la memoria del paciente directamente con él/ella
FONDECYT2022E1	Tarea experimental FONDECYT 2021 Gorka Navarrete	Tarea experimental para evaluar mejoras en la comprensión de PPV y NPV a partir de presentación de apoyo pictórico
GBS	Global Beliefs Screening	Evalúa las creencias del entrevistado
GHQ12	12-item General health questionnaire	Detecta personas con trastorno psiquiátrico diagnosticable
Goodbye	Goodbye task	Despedida del experimento. Entrega el código aleatorio de participación
HRPVB	High risk perception of vaginal birth	NA

Table 3.1: Test *(continued)*

short_name	Nombre	Descripcion
HRPVBpost	High risk perception of vaginal birth (POST)	NA
IBT	Impulsive buying Tendency	Mide impulsividad de compra
IDQ	Cuestionario de Identificación	Cuestionario que permite identificar a los individuos y además contiene preguntas sobre diagnósticos psiquiatricos.
IEC	Rotters internal-External control scale	Mide el grado en que las personas creen que ejercen control sobre sus vidas (controladas internamente) o el grado a los que sienten que sus destinos están más allá de su propio control y están determinados por el destino (controladas externamente)
INFCONS	Cesarean information brochures	Entrega información sobre las cesáreas (consentimiento informado)
IRI	Interpersonal reactivity index	Es una medida de empatía de diferencia individual con un enfoque multidimensional. (Medida de autoinforme)
IRS	Importance of Rationality Scale	Mide la importancia personal (no verbal) que los individuos asignan a la formación y evaluación de la creencia sobre bases racionales
MDMQ	Melbourne Decision Making Questionnaire	Mide patrones de afrontamiento de decisiones
MIS	Magical ideation scale	Mide el nivel de pensamiento mágico del individuo
OBJNUM	Lipkus numeracy Test	Mide el rendimiento en preguntas de resolución numérica
OTRASRELIG	Varias preguntas sobre creencias religiosas	Escala con multiples preguntas sobre religión. Creada a partir de preguntas propias y multiples escalas.
PRFBM	Preferencia of birth mode in normal pregnancy	NA
PRFBMpost	Preferencia of birth mode in normal pregnancy (post)	NA

Table 3.1: Test *(continued)*

short_name	Nombre	Descripcion
PSETPP	Percepciones sobre el embarazo, trabajo de parto y parto (Fear of birth scale)	Evalúa las actitudes y sentimientos del individuo hacia el embarazo, trabajo de parto y parto.
PSPPC	Percepciones sobre el parto por cesárea	NA
PSS	Perceived Stress Scale	Mide el grado en que las situaciones en la vida de uno son valoradas como estresantes.
PVC	Preguntas vacuna COVID-19	Entrega información respecto al estado de vacunación contra covid19
PWb	Psychological well being-scale	Mide el bienestar psicológico
R-PBS	Paranormal Belief Scale	Proporciona una medida del grado de creencia en siete dimensiones
REI40	Rational-Experiential intentory-40	Mide las diferencias individuales de dos dimensiones independientes del procesamiento humano: racional y experiencial.
Report	Tarea para solicitar autorización y detalles para enviar reporte automatizado con resultados de participantes	La tarea Report solicita autorización y detalles para enviar reporte automatizado. Existe un archivo Rmd en jsPsychHelpeR que trabaja con el input de esta tarea para generar reportes automatizados para los participantes.
RTS	The Revised Transliminality Scale	Mide el nivel de transliminalidad del entrevistado.
SASS	Social Adaptation Self-evaluation Scale	Estudia la motivación y el comportamiento del paciente en distintas áreas
SBS	Supernatural Belief Scale	Evalua la medida de la creencia en agentes religiosos sobrenaturales, lugares y eventos.
SCSORF	Santa Clara Strength of Religious Faith Questionnaire	Evalúa la fuerza de la fe religiosa.
SDG	Socio Demográfico General	Recolecta información demográfica del individio
SRA	Self-Reported Altruism Scale	Mide el altruismo del individuo

Table 3.1: Test *(continued)*

short_name	Nombre	Descripcion
SRBQP	Self-regulation and belief questionnaire in pandemic	NA
SRSav	Springfield Religiosity Scale (Abbreviated Version)	Refleja una perspectiva judeocristiana conservadora o tradicional
STAI	State-Trait Anxiety Inventory	Entrega una medida empírica del nivel de ansiedad "normal" en adultos, medinate la medición de 2 conceptos independientes.
SWBQ	Spiritual wellbeing questionnaire	Mide el bienestar personal, bienestar comunitario, bienestar ambiental y bienestar trascendental.
WEBEXEC	Web based executive funtion questionnaire	Refleja la experiencia general de los participantes sobre los problemas ejecutivos en lugar de cualquier aspecto específico de los mismos.

3.2 Experiment configuration

In the `config.js` file you can find the main parameters to control how your experiment works.

There is a shiny app in `jsPsychMaker/app/` to help you create a `config.js` with the main parameters for your protocol using a visual interface. You can run the app locally or go to jsPsychMaker_config Shiny APP. You will need to copy the generated config.js file to your protocol folder. The Shiny app can also help you create a parametrized consent form (see the Consent tab).

3.2.1 Main parameters

- `pid = 999999;`: Number of protocol

- `online = true;`: true if the protocol run in a server, false if runs locally

- `max_participants = 3;`: If you have `between participants` conditions (participants are assign to only one of a number of conditions), this is the max number of participants per condition

- `random_id = false;`: true if you want to assign a random id to participants, false if the participant needs to input an id

- `max_time = "24:00:00";`: Max time to complete the protocol (HH:MM:SS; Hours:Minutes:Seconds)

- `accept_discarded = true;`: If an user is discarded (over max_time), shall be allowed to continue given there are available slots?

- `debug_mode = false;`: When testing the protocol it shows DEBUG messages, creates the DB tables if they don't exist… It also forces the tasks with random order of items to avoid the randomization so the `jsPsychMonkeys` can have a reproducible behavior.

3.2.2 Order of tasks

```
first_tasks = ['Consent'];//  The protocol will start with these tasks in sequential order
last_tasks = ['Goodbye'];//  Last block of tasks presented (in sequential order)
```

Create as many blocks as needed:

```
randomly_ordered_tasks_1 = ['TASK1', 'TASK2']; //  Block of tasks in random order
randomly_ordered_tasks_2 = ['TASK3']; //  Block of tasks in random order
secuentially_ordered_tasks_1 = ['TASK5', 'TASK4']; // Block of tasks in sequential order
```

The final array of tasks can be build combining the above blocks. The order of the tasks in the arrays starting with "random" will be randomized.

```
tasks = ['first_tasks',
         'randomly_ordered_tasks_1',
         'secuentially_ordered_tasks_1',
         'randomly_ordered_tasks_2',
         'last_tasks'];
```

3.2.3 Between-subject tasks

The variable `all_conditions` in `config.js` let's you define the Independent Variables (IV) and levels for the between-subject tasks:

If there is no between-subject task:

```
all_conditions = {"protocol": {"type": ["survey"]}};
```

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If there are between-subject tasks:

```
all_conditions = {"NAMETASK": {"name_IV": ["name_level1", "name_level2"]}};
```

jsPsychR will randomize participants to the different conditions keeping the unbalance between conditions to the minimum possible.

3.3 online-offline protocols

jsPsych uses standard web technologies (HTML, CSS y Javascript), so that protocols should run in any modern browser (updated, please). We recommend Google Chrome just because our test suite runs with Google Chrome, so we will catch its specific issues earlier.

3.3.1 Offline

If you want to run a protocol locally (on your computer, on a lab computer), you need to:

- set `online = false;` in the `config.js` file
- double click index.html

jsPsychR will use `IndexedDB` to store the participants' progress and balance between conditions. The output csv files will be Downloaded to the Download folder of the computer where the protocol runs.

3.3.1.1 CORS ERRORS

If any of the tasks imports an html file, the Offline protocol will give a CORS error.

There are ways to disable web security in your browser, but it **MUST only be done if your experiment computer runs offline**, otherwise you will be exposed to very bad things.

See how to run chrome disabling web security to avoid CORS error:

- `google-chrome --disable-web-security --user-data-dir="~/"`

3.3.2 Online

Tu run a protocol online, set `online = true;` in the `config.js` file. You will need a couple more things:

- MySQL running in your server

- A file `.secrets_mysql.php` with the content below

- Define the route to `.secrets_mysql.php` in `controllers/php/mysql.php`

    - `require_once '../../.secrets_mysql.php';`

    - THIS FILE **MUST NOT** BE PUBLICLY VISIBLE FROM THE BROWSER

- **Upload the files to the server** :)

```php
<?php

/* DO NOT UPLOAD TO PUBLIC REPO */

  $servername = "127.0.0.1";
  $username = "USERNAME OF THE DATABASE";
  $password = "PASSWORD OF THE DATABASE";
  $dbname = "NAME OF THE DB";

?>
```

`jsPsychR` will use `MySQL` to store the participants' progress and balance between conditions. The output csv files will be Downloaded in the `.data/` folder inside the protocol folder in the server.

Before launching the final experiment, make sure you start with a clean slate! That can be summarized in 3 simple steps:

1. Check the configuration for you experiment (`config.js`) and make sure all is well. Some of the critical bits are:

```
pid = 999; // SHOULD have your project ID!
online = true; // true is good
max_participants = 100; // Max participants per contition [number]
max_time = "24:00:00"; // Max time to complete the protocol [HH:MM:SS]
debug_mode = false; // SHOULD be false
```

2. Check that the `.data/` folder for your protocol is empty in the server. You will likely have remains of the piloting and Monkeys.

3. Clean up the MySQL data associated to your protocol.

```
SET @PID = 999; // HERE YOUR PROTOCOL ID!

delete from experimental_condition where id_protocol=@PID;
delete from user where id_protocol=@PID;
delete from user_condition where id_protocol=@PID;
delete from user_task where id_protocol=@PID;
delete from task where id_protocol=@PID;
delete from protocol where id_protocol=@PID;
```

You will most likely need help from the server admin to perform these steps.

3.4 Need help implementing a task!

If you need help creating a NEW task, see the section help creating a new task.

3.5 Developing tasks

Remember to place an `if (debug_mode === false)` before the randomization of the item order so when running in debug_mode, the items are not randomized. This is important so the behaviour of the jsPsychMonkeys is reproducible:

```
if (debug_mode === false) NAMETASK = jsPsych.randomization.repeat(NAMETASK,1);
```

3.6 Technical aspects

We currently use jsPsych 6.3, and plan to migrate to the last stable jsPsych at some point. There is a migration guide and a Github issue with migration questions.

3.6.1 Misc

When index.html is launched:

- Checks if there are available slots

When an uid is assigned:

- `questions` array is created
- `between-participants` conditions are assigned and stored in the DB (MySQL if online, IndexedDB if offline)

Each question, timeline or conditional question needs to have a:

```
data: {trialid: 'NameTask_001', procedure: 'NameTask'}
```

The `trialid` identifies the trial, and the `procedure` makes possible to find that trial so participants can continue the tasks where they left, know when participants finished the tasks, etc. This is done in MySQL if online, IndexedDB if offline.

`trialid`'s need to have a standardized structure, which generally conforms with `NameTask_3DigitNumber`. When using conditional items the structure can be a bit more complex, but not much. We use the following rules to check for non-complying trialid's:

```
^[a-zA-Z0-9]{1,100}_[0-9]{2,3}$ -> `NameTask_2or3DigitNumber`, for example `BNT_001`
^[a-zA-Z0-9]{1,100}_[0-9]{2,3}_[0-9]{1,3}$ -> `NameTask_2or3DigitNumber_1to3DigitsSuffix`, fo
^[a-zA-Z0-9]{1,100}_[0-9]{2,3}_if$ -> `NameTask_2or3DigitNumber`, for example `BNT_002_if`
^[a-zA-Z0-9]{1,100}_[0-9]{2,3}_[0-9]{1,3}_if$  -> `NameTask_2or3DigitNumber`, for example `B
```

3.6.2 jsPsychMaker main changes on a task

1. Start of a task

```
questions = ( typeof questions != 'undefined' && questions instanceof Array ) ? questions
questions.push( check_fullscreen('NameOfTask') );
NameOfTask = [];
```

2. Each item

```
data: {trialid: 'NameOfTask_01', procedure: 'NameOfTask'}
```

3. End of experiment

```javascript
if (debug_mode == 'false') NameOfTask = jsPsych.randomization.repeat(NameOfTask, 1);
NameOfTask.unshift(instruction_screen_experiment);
questions.push.apply(questions, NameOfTask)

questions.push({
    type: 'call-function',
    data: {trialid: 'NameOfTask_000', procedure: 'NameOfTask'},
    func: function(){
      if (online) {
        var data = jsPsych.data.get().filter({procedure: 'NameOfTask'}).csv();
      } else {
        var data = jsPsych.data.get().filter({procedure: 'NameOfTask'}).json();
      }
      saveData(data, online, 'NameOfTask');
    }
});
```

3.6.3 Conditional questions

```javascript
var question001 = {
  type: 'survey-multi-choice-vertical',
  questions: [{prompt: '<div class="justified">¿Usted se ha vacunado contra el coronavirus
  data: {trialid: 'PVC_001', procedure: 'PVC'}
};
PVC.push(question001);

var question001_1 = {
  type: 'survey-multi-choice-vertical',
  questions: [{prompt: '<div class="justified">¿Usted se va a vacunar contra el coronaviru
  data: {trialid: 'PVC_001_1', procedure: 'PVC'}
};

var if_question001_1 = {
  timeline: [question001_1],
  data: {trialid: 'PVC_001_1_if', procedure: 'PVC'},
  conditional_function: function(){
    let data = (JSON.parse((jsPsych.data.get().values().find(x => x.trialid === 'PVC_001')
    if((data) ==  'No'){
```

```
        return true;
    } else {
        return false;
    }
  }
};
PVC.push(if_question001_1);
```

3.7 Common ERRORS

If you get the following error in the console: `Uncaught TypeError: Cannot read properties of undefined (reading 'procedure')`

Run this in the console:

```
for (var i = 0; i < questions.length; i++) {
  console.log(i + questions[i].data["procedure"])
}
```

It will stop in one of the items. Go to the console, check the array `questions` and go to the number that failed.

When you know the task and item that fails, you probably need to add:

```
`data: {trialid: 'TASKNAME_ITEMNUMBER', procedure: 'TASKNAME'}
```

4 jsPsychMonkeys

---

jsPsychMonkeys: Release monkeys to a jsPsych experiment using the R package {targets}, docker and {RSelenium}.

With jsPsychMonkeys you can simulate participants and easily do the following:

- Simulate participants online and offline
- Simulate participants sequentially and in parallel
- Ask your Monkeys to take pictures of each screen
- Make the behavior of the Monkeys reproducible setting a random seed associated with their unique id
- Store logs of the process, including console logs with errors
- Watch your participants randomly click things in VNC

See QuickGuide for basic instructions.

4.1 How to simulate participants

If the QuickGuide configuration steps didn't work... You may need to do one of the things below:

- Run participants manually

- Use a Linux computer or create a Linux partition

- Create a Linux virtual machine from where to simulate participants. You can use Virtualbox to install Ubuntu. Once there, you can use this manual to prepare the system to run R & RStudio

4.2 Parameters

Edit the `Parameters` section of the `_targets.R` file. The minimal set of parameters needed are:

```
parameters_monkeys_minimal = list(
  uid = 1:10, # User id's for the participants.
  local_folder_tasks = "Downloads/tests/2" # Location of your jsPsych protocol
)
```

4.2.1 Release the Monkeys!

If you want a sequential process:

- `targets::tar_make()`

If you want a parallel horde of monkeys:

- `targets::tar_future_make(workers = 2)`

You can set as many parallel workers as you want. With `targets::tar_make_future(workers = future::availableCores() - 1)` you can have as many workers as your computer cores minus 1.

In `run.R` you can see the typical set of commands needed for a variety of situations.

---

10 Monkeys completing a protocol in parallel. You can use `targets::tar_watch(seconds = 10, outdated = FALSE, targets_only = TRUE)` to see the live progress:
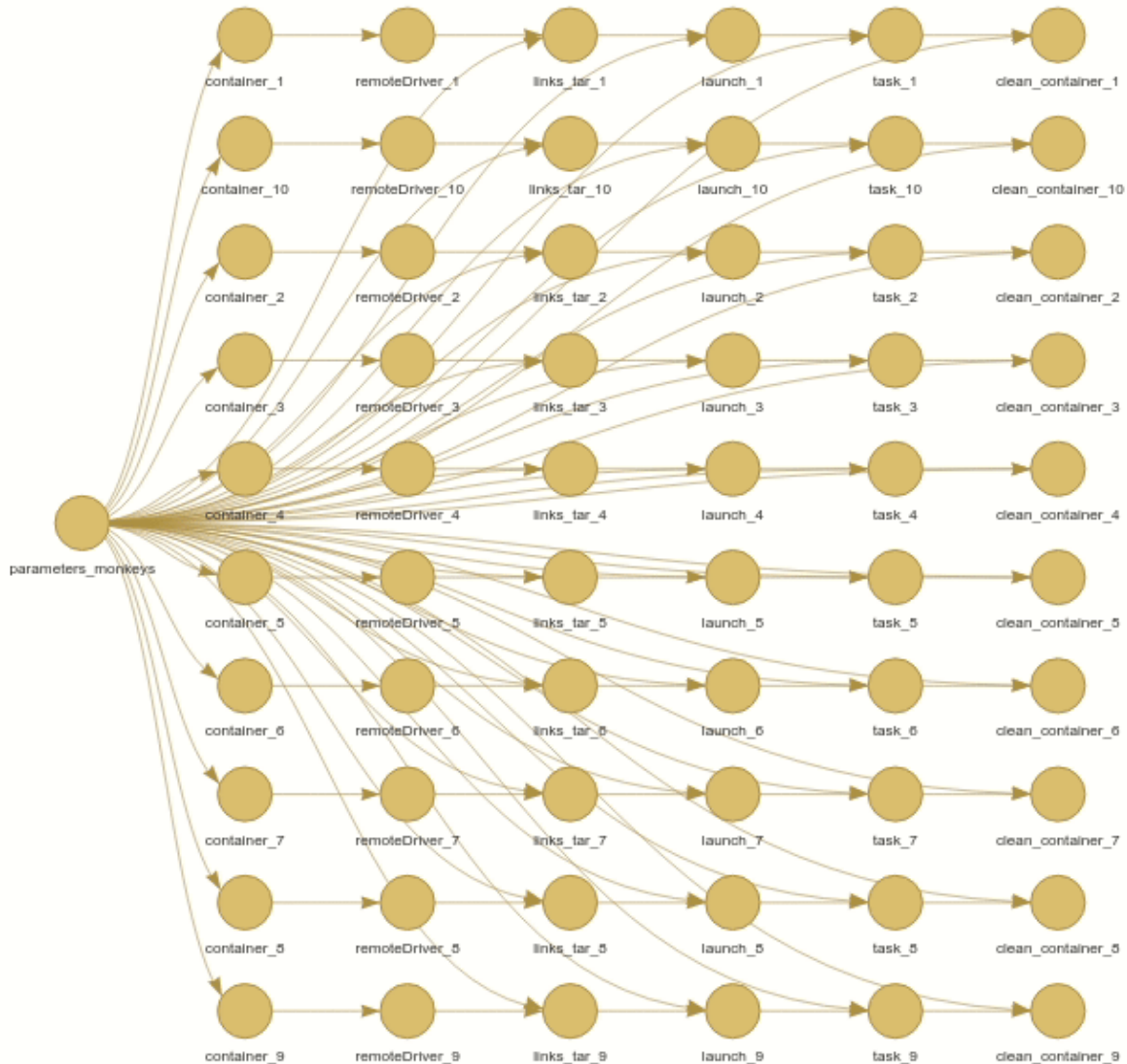
4.2.2 Launch monkeys on a server

You will need a `.vault/SERVER_PATH.R` file that contains the path where the protocols are located in your server: `server_path = "http://URL_OF_YOUR_SERVER/PROTOCOLS_GENERAL_FOLDER/"`

With the `server_folder_tasks` you will set the subfolder where the protocol is located. In the example below the monkeys would go to, `http://URL_OF_YOUR_SERVER/PROTOCOLS_GENERAL_FOLDER/1`

```
parameters_monkeys_minimal = list(
  uid = 1:10, # User id's for the participants.
  server_folder_tasks = "1" # Location of your jsPsych protocol
)
```

4.2.3 Parameters for **parameters_monkeys_minimal**

There are a few parameters that can be useful:

- `uid_URL = TRUE`: The uid is passed in the URL (e.g. `&uid=1`)

- `local_folder_tasks = rep("Downloads/tests/test_prototol", 25)`: Passing a vector of multiple tasks will make the monkeys to complete all of them.

- `keep_alive = TRUE` Keep the docker container alive after completing the tasks

- `DEBUG = TRUE` Activate DEBUG mode. Lot's of stuff will show up in the console.

- `open_VNC = TRUE` Activate DEBUG mode and open a VNC container to see the monkey's progress.

- `screenshot = TRUE` The monkeys will take a picture of all the pages they see. The .png files are stored in `outputs/screenshots`

- `debug_file = TRUE` Activate DEBUG mode and store all the console output in the `outputs/log`

- `big_container = TRUE` Sets the Shared memory size (/dev/shm) to 2 gigabytes. This is useful to avoid long/complex protocols to crash

- `disable_web_security = TRUE` If you are running a local protocol that loads external files (e.g. consent form in a html file), you may need this. Only works with Google Chrome.

- `console_logs = TRUE` Store the browser's console logs. Only works with Google Chrome

- `forced_random_wait = TRUE` Will wait a randomly sampled number of seconds on page 4

- `forced_seed = 11` Set a random seed so the Monkeys' behavior will be fully reproducible

- `forced_refresh = 20` Refresh browser in page 20 (if TRUE is given, it will refresh in a randomly sampled page)

4.2.3.1 Parameters details

- `local_folder_tasks`: If the folder is not accessible to Docker (anything outside the Download folder), jsPsychMonkeys will create a copy of the protocol in `Downloads/JSPSYCH/`

4.3 Technical aspects

Since jsPsych 7.1 there is a simulation mode available, which should be much faster than the good ol' monkeys. Once we migrate to jsPSych 7.x, we will probably retire this section.

5 jsPsychHelpeR

---

jsPsychHelpeR: Standardize and automatize data preparation and analysis of jsPsych experiments created with jsPsychMaker.

---

jsPsychHelpeR will lend you a hand automatizing and standardizing your data preparation and analysis.

- Use a completely open, reproducible and automatic process to prepare your data

- Data preparation ready for > 50 tasks (see here the list of tasks)

- Get tidy output dataframes for each task, and tidy general dataframes for the whole protocol

- Include tests for common issues

- Automatic reports with progress, descriptives, codebook, etc.

See QuickGuide for basic instructions.

5.1 How to prepare data

Our goal is that jsPsychMaker task has a sister script on jsPsychHelpeR to help prepare the data automatically. If a task you need does not have one, you can try to create the script yourself and do a pull request in the jsPsychHelpeR repo, or see the section help creating a new task.

If you already ran a pilot experiment, simply:

1. Download `jsPsychHelpeR`:

```
if (!require('usethis')) install.packages('usethis'); library('usethis')
usethis::use_course("gorkang/jsPsychHelpeR")
```

2. `run_initial_setup()`: go to the file `run.R` and run the following two lines. They will:

- Try to make sure you have all the dependencies, folders, etc.

- Download all the data from your protocol (you will need the FTP credentials and set `download_files = TRUE`)

- Download and zip a copy of the full protocol without the data (you will need the FTP credentials and set `download_task_script = TRUE`)

- Create a customized `_targets.R` file adapted to the data of your protocol, so data preparation can run automagically

```
invisible(lapply(list.files("./R", full.names = TRUE, pattern = ".R$"), source))
run_initial_setup(pid = "999", download_files = TRUE, download_task_script = TRUE)
```

This should work on Ubuntu, if you have the FTP credentials, and `sshpass` and `rsync` installed.

If you don't have the credentials, or some of the requirements to download the files, you can manually copy the .csv files to the `data/PROJECT ID` folder, and then run the `offline` version of `run_initial_setup()`:

```
invisible(lapply(list.files("./R", full.names = TRUE, pattern = ".R$"), source))
run_initial_setup(pid = "999", download_files = FALSE, download_task_script = FALSE)
```

5.1.1 Targets pipeline

To help make the pipeline reproducible and more efficient, we use the targets package (Landau 2021). A few basic things to know:

- **The whole process can be reproduced running `targets::tar_make()`**

- A nice visualization of all the pre-processing steps can be seen with `targets::tar_visnetwork(targets_o` `= TRUE)`

- The file `_targets.R` contains the important parameters and calls to all the functions used when running `targets::tar_make()`

To see more detail about any specific step, you can:

1. Go to the relevant function in `_targets.R` (cursor on a function, then F2)

2. Load the input parameters of the function with `debug_function(NAME_OF FUNCTION)`. Alternatively, manually use `targets::tar_load(NAME_OF_TARGET)`

3. Run the code step by step as you would normally do

5.2 Basics

jsPsychHelpeR uses as input a data created with a jsPsychMaker experimental protocol.

5.2.1 Inputs

The input data folder will be named after the protocol_id, for example `999/` and needs to be placed in the `data/` folder of the jsPsychHelpeR project `data/YOUR_PROJECT_NUMBER`:

- The data folder can contain either multiple .csv files, or a single .zip file

There will be a single .csv file for each participant and task of the protocol. For example:

- 999_Consent_original_2022-04-02T205622_1.csv:

  - [project: 999]_[experimento: Consent]_[version: original]_[datetime: 2022-04-02T205622]_[participant id: 1]

5.2.2 Outputs

When the pipeline successfully runs with `targets::tar_make()`, a number of outputs will be created.

All the outputs can be found in the `/outputs` folder. The only exception is the sensitive data and reports, which can be found in `.vault/outputs`. WARNING: The '.vault/' folder **MUST NOT** be made public.

5.2.2.1 Output folders

The outputs will be organized in different folders:

- **Data frames** for different stages of data processing can be found in `outputs/data`

- **Temporary files for manual correction** are in `outputs/data/manual_correction` (the final manual correction files must be place by the user in `data/manual_correction`). WARNING: These will be overwritten each time the pipeline runs

- **Plots**, **tables** and **reports** are in `outputs/plots`, `outputs/tables` and `outputs/reports` respectively.

- **Test outputs** are in `outputs/tests_outputs`

- **Anonymized Raw data** will be moved to `.vault/data_vault/`

5.2.2.2 Output dataframes

There will be a single data frame (df) for each of the tasks in `outputs/data`, plus a data frame (DF) for each of the steps of the data preparation, and a dictionary file listing all the available tasks. We store the files in two formats, csv and rds:

- **DF_raw.csv**: All the `data/project_id/` csv files combined on a single file. We only add the columns "project", "experimento", "version", "datetime", "id" by parsing the filenames

- **DF_clean.csv**: Clean version of the raw file ready to process the individual tasks

- **df_ShortNameOfTask.csv**: One df for each of the tasks of the protocol after being processed with the `prepare_ShortNameOfTask()` functions

- **DF_joined.csv**: all the processed tasks joined in a single DF

- **DF_analysis**: only the total scores and dimensions from `DF_joined` (columns ending in `_DIRt`, `_STDt`, `_DIRd`, `_RELd`, `STDd`). Can be visually explored using the shiny app in `Rmd/app.R`

- **DICCIONARY_tasks.csv**: list of all tasks in the protocol

5.2.2.3 Output dataframes column names

All the output processed data frames columns are named in a standardized way:

- **ShortNameOfTask_ItemNumber_RAW**: raw responses of participants for individual items

- **ShortNameOfTask_ItemNumber_DIR**: processed raw responses following the task correction instructions (e.g. inverting certain items, converting strings to numbers, computing accuracy...)

- **ShortNameOfTask_RAW_NA**: number of missing data (NA) in the RAW responses

- **ShortNameOfTask_DIR_NA**: number of missing data (NA) in the DIR responses. If it is not equal to `ShortNameOfTask_RAW_NA` there is something wrong in the items correction.

- **ShortNameOfTask_DimensionName_DIRd**: scores for a specific dimension (`d`) in a task, calculated following task correction instructions (e.g. summing or averaging certain items)

- **ShortNameOfTask_DimensionName_RELd**: scores for a specific dimension (`d`) in a task, calculated following task correction instructions AND after filtering items with low reliability. See Reliability section for more information.

- **ShortNameOfTask_DimensionName_STDd**: standardized score for a dimension (`d`)

- **ShortNameOfTask_DIRt**: total (`t`) score for a task calculated following task correction instructions (e.g. summing or averaging all items)

- **ShortNameOfTask_STDt**: standardized (`t`) score for a task

5.3 Advanced

5.3.1 Need help preparing new task

If you need help preparing a NEW task, see the section help with new tasks.

5.3.2 Create your own reports

You can use any of the template reports in the `_targets.R` file, or create your own reports.

We will start opening one of the template reports: `rstudioapi::navigateToFile("doc/report_analysis.Rmd`

- Edit the RMarkdown file to adapt it to your needs.

- If you already did `targets::tar_make()`, when running `targets::tar_load(DF_analysis)` the dataframe `DF_analysis` will load in your Environment.

Go back to the `_targets.R` file:

- Look for `# Analysis report` and uncomment the following lines:

```
# tar_render(report_analysis, "doc/report_analysis.Rmd",
#            output_file = paste0("../outputs/reports/report_analysis.html")),
```

When you finished editing and uncomented the tar_render command, go back to the `run.R` file:

- `targets::tar_make()`

5.3.3 Create new tasks

To create the correction script for a new task, you start with:

- `create_new_task(short_name_task = "NAMETASK")`

This will:

- create a new file from a template correction script (`R_tasks/prepare_TEMPLATE.R`)

- adapt it to your `short_name_task` to make everything as standardized as possible

- open the new `prepare_NAMETASK.R` file

If the parameter `get_info_googledoc = TRUE`:

- The NEW tasks document is checked.

- If the document has been filled properly, it will show in the console standardized strings (ready to be copy/pasted to the new `prepare_NAMETASK.R` file) about:

  - dimension names

  - items corresponding to each dimension

- dimension calculation

- inverse items

- numeric conversion of items

You can also use `get_dimensions_googledoc()` as a standalone function:

`get_dimensions_googledoc(short_name_text = "MLQ")`

All the `prepare_NAMEOFTASK.R` scripts on the `R_tasks/` folder have been created starting from the same template. The only exception are the experimental tasks and some surveys with particularities that require more complex adaptations.

When you finish implementing the correction script, please do a Pull request so we can add you script to the pool. If you have not already, please help us filling up details about the task in the NEW tasks document.

5.3.4 Adapting new tasks

`get_dimensions_googledoc` will show you how to adapt the `prepare_TASK()` script, but you will need to know how it works to be able to edit the relevant bits. Also, sometimes `get_dimensions_googledoc` won't get all the details of the task right, or there could be non-standard elements to it. Here, we will describe some of the elements of the template to help understand how it works.

Remember you should **ALWAYS** start with `create_new_task(short_name_task = "NAMETASK")` so your task template works well with `jsPsychHelpeR`.

There are three chunks you will need to adapt to have a fully working preparation script.

- `[ADAPT 1/3]: Items to ignore and reverse, dimensions`
- `[ADAPT 2/3]: RAW to DIR for individual items`
- `[ADAPT 3/3]: Scales and dimensions calculations`

5.3.4.1 Items to ignore and reverse, dimensions

```
# [ADAPT 1/3]: Items to ignore and reverse, dimensions ----------------------
# ****************************************************************************

description_task = "" # Brief description here

items_to_ignore = c("000") # Ignore these items: If nothing to ignore, keep as is
items_to_reverse = c("000") # Reverse these items: If nothing to reverse, keep as is
```

```r
## NameDimension1, NameDimension2 should be the names of the dimensions
## Inside each c() create a vector of the item numbers for the dimension
## Add lines as needed. If there are no dimensions, keep as is
items_dimensions = list(
  NameDimension1 = c("000"),
  NameDimension2 = c("000")
)

# [END ADAPT 1/3]: ********************************************************
# ************************************************************************
```

5.3.4.2 RAW to DIR for individual items

```r
DF_long_DIR =
    DF_long_RAW %>%
    select(id, trialid, RAW) %>%



  # [ADAPT 2/3]: RAW to DIR for individual items --------------------------------
  # ************************************************************************

    # Transformations
    mutate(
      DIR =
        case_when(
          RAW == "Nunca" ~ 1,
          RAW == "Poco" ~ 2,
          RAW == "Medianamente" ~ 3,
          RAW == "Bastante" ~ 4,
          RAW == "Mucho" ~ 5,
          is.na(RAW) ~ NA_real_,
          grepl(items_to_ignore, trialid) ~ NA_real_,
          TRUE ~ 9999
        )
    ) %>%

    # Invert items
    mutate(
      DIR =
```

```
        case_when(
          DIR == 9999 ~ DIR, # To keep the missing values unchanged
          trialid %in% paste0(short_name_scale_str, "_", items_to_reverse) ~ (6 - DIR),
          TRUE ~ DIR
        )
    )

  # [END ADAPT 2/3]: ********************************************************
  # *************************************************************************
```

5.3.4.3 Scales and dimensions calculations

```
# [ADAPT 3/3]: Scales and dimensions calculations ---------------------------
# *************************************************************************

# Reliability ------------------------------------------------------------
# REL1 = auto_reliability(DF_wide_RAW, short_name_scale = short_name_scale_str, items = it
# items_RELd1 = REL1$item_selection_string


# [USE STANDARD NAMES FOR Scales and dimensions: names_list$name_DIRd[1], names_list$name_
# CHECK with: create_formulas(type = "dimensions_DIR", functions = "sum", names_dimensions
DF_wide_RAW_DIR =
  DF_wide_RAW %>%
  mutate(

    # [CHECK] Using correct formula? rowMeans() / rowSums()

    # Score Dimensions (see standardized_names(help_names = TRUE) for instructions)
    !!names_list$name_DIRd[1] := rowMeans(select(., paste0(short_name_scale_str, "_", item
    !!names_list$name_DIRd[2] := rowSums(select(., paste0(short_name_scale_str, "_", items

    # Reliability Dimensions (see standardized_names(help_names = TRUE) for instructions)
    # !!names_list$name_RELd[1] := rowMeans(select(., paste0(short_name_scale_str, "_", it

    # Score Scale
    !!names_list$name_DIRt := rowSums(select(., matches("_DIR$")), na.rm = TRUE)

  )
```

```
# [END ADAPT 3/3]: *****************************************************
# **********************************************************************
```

5.3.5 DEBUG tasks

At the begining of each of the `R_tasks/prepare_NAMETASK.R` scripts you will find a commented `debug_function(prepare_NAMETASK)` line.

When running it, it will load the input parameters for the task. From there, you can work inside of the preparation scipt as you would normally do in a R script.

If you get the error `"Error in debug_function(prepare_NAMETASK) : could not find function 'debug_function'`debug_function()`does nor work"` you will need to load all the functions in the `R/` folder first.

You can do this in one of three ways:

- `CONTROL + P` shortcut will work if the `run_initial_setup()` completed correctly (at least on Ubuntu systems).

- Run `targets::tar_load_globals()`

- Or directly, source all the scripts in the `R/` folder: `invisible(lapply(list.files("./R", full.names = TRUE, pattern = ".R$"), source))`

5.4 Helper functions

5.4.1 Reliability

You can use the `auto_reliability()` function to help you automatically filter items with low reliability (although doing this automatically is probably a bad idea). The function uses `psych::alpha()` and filters by default items with an r.drop $<= 0.2$. See `psych::alpha()` help for more details. **IMPORTANT**: Using `psych::omega()` is generally a better idea, see the alpha help page.

An example can be found in prepare_REI40().

The basic logic would be:

```
# Define items for a specific dimension
items_DIRd1 = c("01", "02", "03", "04", "05", "06", "07", "08", "09", "10")

# Calculate reliability
```

```
REL1 = auto_reliability(DF_wide_RAW, short_name_scale = short_name_scale_str, items = item

# Store item selection in a variable
items_RELd1 = REL1$item_selection_string

# In the final Dimension calculation, use the item selection including only the items with
## See `items_RELd1` below
!!names_list$name_RELd[1] := rowMeans(select(., paste0(short_name_scale_str, "_", items_RE

# Compare it with the calculation including the original items
## See `items_DIRd1` below
!!names_list$name_DIRd[1] := rowMeans(select(., paste0(short_name_scale_str, "_", items_DI
```

5.5 Technical aspects

5.5.1 How trialid's are processed

See `PRFBM`:

- If more than one response per screen

  - Item: `PRFBM_04`
  - Responses: `{"daño":"Parcialmente en desacuerdo","beneficio":"Parcialmente en desacuerdo"}`
  - final trialids: `PRFBM_04_beneficio` and `PRFBM_04_daño`

5.6 Common ERRORS

5.6.1 `run_initial_setup()`:

```
x Can find server credentials in '.vault/.credentials'
x 0 tasks found for protocol 'TU NUMERO DE PROYECTO'. NOT creating _targets.R file
```

5.6.1.1 On Linux (Ubuntu):

- IF you have the server credentials:

  - Open .credentials_TEMPLATE `rstudioapi::navigateToFile(".vault/.credentials_TEMPLATE"`

  - Edit the file with your server credentials

– Rename the file to `.credentials`

- IF you DON'T have the credentials but you have the .csv results files:

  – Copy the csv files to the folder `data/YOUR_PROJECT_NUMBER`

  – Run again `run_initial_setup()`

5.6.2 On Mac or Windows:

- Copy the csv files to the folder `data/YOUR_PROJECT_NUMBER`

- Run again `run_initial_setup()`

5.7 Rendering Rmd's

> Error: ! missing files _targets/meta/meta Execution halted

It is better to run everything, including your reports, inside the pipeline (`targets::tar_make()`).

If you need to the knitr (or render) button, you will have to:

- Load DF's `DF_analysis = readr::read_rds(here::here("_targets/objects/DF_analysis"))` instead of `targets::tar_load(DF_analysis)`
- Include all the necessary `library()` calls

> Error : Could not parse knitr report Rmd/report_analysis.Rmd to detect dependencies: Scanner error: mapping values are not allowed in this context at line 6, column 17

There is something wrong in Your YAML heather.

6 jsPsychR Admins

Instructions and protocols for jsPsychR admins. The goal is to minimize issues and make sure tasks behave in a consistent and reproducible manner.

6.1 Google Docs

- All tasks
- List of protocols
- NEW tasks
- Checks specific tasks

6.2 Folders and how to work

We have two main locations, the Github jsPsychMaker project and the server.

Github jsPsychMaker project

- canonical_protocol:

  - machinery: last stable version
  - tasks: all available tasks
  - server: `protocols/999/`

- canonical_protocol_DEV

  - machinery: development version
  - tasks: all available tasks
  - server: `protocols/test/canonical_protocol_DEV/`

- canonical_protocol_clean

  - machinery: last stable version
  - tasks: Consent and Goodbye
  - server: `protocols/test/canonical_protocol_clean/`

- protocols_DEV

  - machinery: last stable version
  - should only contain tasks in development
  - server: `protocols/test/protocols_DEV/`

In `protocols_DEV` we prepare the new **protocolos**:

- Create a copy in `test/protocols_DEV` of `canonical_protocol_clean` and rename to the number of the new protocol, `test/protocols_DEV/NumberOfProtocol`

- Once the protocol is ready:

  - Copy protocol to root folder: `protocols/NumberOfProtocol`
  - ZIP subfolder and move zip to `protocols/test/protocols_DEV/OLD_TESTS/`
  - Delete folder `test/protocols_DEV/NumberOfProtocol`

  - If there are new tasks:
    * CHECK with: check_missing_prepare_TASK()
    * TEST with create_protocol_with_NEW_tasks.R
    * Copy tasks, images, videos, specific plugins, etc. to `protocols/999/`
    * TEST in canonical protocol `protocols/999/` just in case there is a weird interaction

6.3 Helper functions

There are a number of helper functions to make some of the jsPsychR admins tasks easier.

6.3.1 Check all protocols

For example, we can use `check_missing_prepare_TASK()` to:

- Download all the protocols (without data) to a local folder (`sync_protocols = TRUE`)

- Check the trialid's of all the tests are OK (`check_trialids = TRUE`)

- Check there are no duplicate short_name of tasks in the tareas jsPsychR and NUEVAS tareas

- Check which tasks do not have a prepare_TASK.R script

- Check tasks with no info on the tareas jsPsychR Google doc

- Check tasks with missing info on NUEVAS tareas

```r
# Open jsPsychHelpeR RStudio project

  # Load check_missing_prepare_TASK() function
  # cli::cli_alert_info(getwd())

  WD = getwd()
  setwd("../../jsPsychHelpeR/")
  source("R/check_missing_prepare_TASK.R")
  # source("../../jsPsychHelpeR/R/check_missing_prepare_TASK.R")
  setwd(WD)

  # If sync_protocols = TRUE, will download to ../CSCN-server/protocols all the protocols
  DF_missing = check_missing_prepare_TASK(sync_protocols = FALSE,
                                          check_trialids = TRUE,
                                          delete_nonexistent = TRUE,
                                          check_new_task_tabs = TRUE,
                                          helper_folder = "../../jsPsychHelpeR",
                                          CSCN_server_folder = "../../CSCN-server/")
```

-- FOLDER: protocols/ --

-- FOLDER: protocols/test/protocols_DEV/ --

-- FOLDER: protocols/999/ ---

-- CHECK missing info in tabs ---

x Tasks missing info in tabs:

* altroncoso@alumnosuaicl.onmicrosoft.com: 2

* buitrago-c@javeriana.edu.co: 9

* jmoraless@uc.cl: 4

* joaquin.migeot@gmail.com: 3

* nicolasmarchant@alumnos.uai.cl: 1

* vicente.soto.d@uai.cl: 3

-- Details --

* altroncoso@alumnosuaicl.onmicrosoft.com: ESV (citas, puntajes, dimensiones) ;
ESZ (citas,)

* buitrago-c@javeriana.edu.co: CIT (citas, puntajes, dimensiones) ; CRQ (citas,
puntajes, dimensiones) ; CTT (citas, puntajes, dimensiones) ; ICvsID (citas,
puntajes, dimensiones) ; LSNS (citas, puntajes, dimensiones) ; MDDF (citas,
puntajes, dimensiones) ; PSC (citas, puntajes, dimensiones) ; SCGT (citas,
puntajes, dimensiones) ; UCLA (citas, puntajes, dimensiones)

* jmoraless@uc.cl: CEL (dimensiones) ; fauxPasEv (puntajes, dimensiones) ; LoB
(citas,) ; Words (puntajes, dimensiones)

* joaquin.migeot@gmail.com: BDI (citas, puntajes, dimensiones) ; LOT (citas,
puntajes, dimensiones) ; MCQ30 (citas, puntajes, dimensiones)

* nicolasmarchant@alumnos.uai.cl: PPD (citas, puntajes, dimensiones)

* vicente.soto.d@uai.cl: NARS (citas, puntajes, dimensiones) ; RMET (citas,
puntajes, dimensiones) ; RobToM (citas, puntajes, dimensiones)

-- CHECK duplicates --

v No duplicated short_name in the Google docs

```
    # - Tasks with no prepare_TASK() script!
    # - Tasks NOT in Google Doc
    # - Check trialid's are OK
    DF_missing
```

$DF_FINAL
A tibble: 33 x 8
     task missing_script missing_gdoc missing_task protocols Nombre Descr~1 EMAIL
     <chr> <chr>   <chr>   <chr>   <chr>   <chr> <chr>   <chr>
 1 BART   <NA>   <NA>   BART   <NA>   Ballo~ Medida~ <NA>
 2 BART   <NA>   <NA>   BART   <NA>   Ballo~ Medida~ fati~
 3 BDI   <NA>   <NA>   BDI   <NA>   <NA>   <NA>   joaq~
 4 BRS   <NA>   <NA>   BRS   <NA>   The B~ Escala~ gork~
 5 CAS   <NA>   <NA>   CAS   <NA>   COVID~ Evalúa~ <NA>
 6 CAS   <NA>   <NA>   CAS   <NA>   COVID~ Evalúa~ fati~
 7 CEL   <NA>   <NA>   CEL   <NA>   Cuest~ Mide l~ jmor~
 8 CIT   <NA>   <NA>   CIT   <NA>   Test ~ Prueba~ buit~
 9 CRQ   <NA>   <NA>   CRQ   <NA>   Escal~ <NA>   buit~
10 CS   <NA>   <NA>   CS   <NA>   Escal~ Mide l~ altr~
... with 23 more rows, and abbreviated variable name 1: Descripcion

$DF_missing_JS_tasks
A tibble: 30 x 3
     task Nombre   Descripcion
     <chr> <chr>   <chr>
 1 BART   Ballon Analogue Rish Task   Medida de riesgo individual mediante~
 2 BDI   <NA>   <NA>
 3 BRS   The Brief Resilience Scale   Escala de resiliencia
 4 CAS   COVID-19 anxiety scale   Evalúa las fluctuaciones en los nive~
 5 CEL   Cuestionario Estilos de Liderazgo Mide los estilos de liderazgo según ~
 6 CIT   Test de inferencia contrafactual Prueba de selección múltiple que eva~
 7 CRQ   Escala de Reserva Cognitiva   <NA>
 8 CS   Escala de Compasión   Mide la Compasión hacia otros
 9 CTT   Test de pensamiento contrafactual <NA>
10 ESV   Empathy Stimulus Validation   <NA>
... with 20 more rows

$DF_missing_script
A tibble: 0 x 2
... with 2 variables: task <chr>, protocols <chr>

$DF_missing_googledoc
```

```
# A tibble: 0 x 2
# ... with 2 variables: task <chr>, protocols <chr>


$MISSING_tabs
# A tibble: 6 x 3
  EMAIL                                  tasks                          TEXT
  <chr>                                  <chr>                          <chr>
1 altroncoso@alumnosuaicl.onmicrosoft.com "ESV (citas, puntajes, dimensio~ "alt~
2 buitrago-c@javeriana.edu.co             "CIT (citas, puntajes, dimensio~ "bui~
3 jmoraless@uc.cl                         "CEL (dimensiones) ; fauxPasEv ~ "jmo~
4 joaquin.migeot@gmail.com                "BDI (citas, puntajes, dimensio~ "joa~
5 nicolasmarchant@alumnos.uai.cl          "PPD (citas, puntajes, dimensio~ "nic~
6 vicente.soto.d@uai.cl                   "NARS (citas, puntajes, dimensi~ "vic~
```

```r
    DF_missing$DF_FINAL %>% tidyr::replace_na(list(missing_script = "",
                                             missing_googledoc = "",
                                             missing_task = ""))
```

```
# A tibble: 33 x 8
   task  missing_script missing_gdoc missing_task protocols Nombre Descr~1 EMAIL
   <chr> <chr>          <chr>        <chr>        <chr>     <chr>  <chr>   <chr>
 1 BART  ""             <NA>         BART         <NA>      Ballo~ Medida~ <NA>
 2 BART  ""             <NA>         BART         <NA>      Ballo~ Medida~ fati~
 3 BDI   ""             <NA>         BDI          <NA>      <NA>   <NA>    joaq~
 4 BRS   ""             <NA>         BRS          <NA>      The B~ Escala~ gork~
 5 CAS   ""             <NA>         CAS          <NA>      COVID~ Evalúa~ <NA>
 6 CAS   ""             <NA>         CAS          <NA>      COVID~ Evalúa~ fati~
 7 CEL   ""             <NA>         CEL          <NA>      Cuest~ Mide l~ jmor~
 8 CIT   ""             <NA>         CIT          <NA>      Test ~ Prueba~ buit~
 9 CRQ   ""             <NA>         CRQ          <NA>      Escal~ <NA>    buit~
10 CS    ""             <NA>         CS           <NA>      Escal~ Mide l~ altr~
# ... with 23 more rows, and abbreviated variable name 1: Descripcion
```

```r
    # Tasks ready to create prepare_*.R script
    DF_missing$DF_FINAL %>% filter(!is.na(missing_script) & is.na(missing_gdoc))
```

```
# A tibble: 0 x 8
# ... with 8 variables: task <chr>, missing_script <chr>, missing_gdoc <chr>,
#   missing_task <chr>, protocols <chr>, Nombre <chr>, Descripcion <chr>,
#   EMAIL <chr>
```

```
    DF_missing$DF_FINAL %>% filter(!is.na(missing_script) | !is.na(missing_gdoc)) %>%
      filter(!task %in% c("DEMOGR24", "DEMOGRfondecyt2022E1", "ITC", "fauxPasEv")) %>%  # "M
      select(-matches("missing"), -Nombre, -Descripcion)
```

```
# A tibble: 0 x 3
# ... with 3 variables: task <chr>, protocols <chr>, EMAIL <chr>
```

6.3.2 Create protocol with NEW tasks

With `create_protocol_with_NEW_tasks.R` we can create a protocol with the tasks for which we do not yet have a control snapshot (no .csv's in the 999.zip data).

This is a necessary step before the task can be moved to the canonical protocol.

The function `find_missing_tasks_in_999()` will read all the csv in `jsPsychHelpeR/data/999/999.zip` and depending on the value of the parameter `search_where` ("prepare_TASK" or "js"):

- all .js tasks in `jsPsychMaker/protocols_DEV/`

- all prepare_TASK.R in `jsPSychHelpeR/R_tasks/`

Comparing both sources, will look for tasks for which we do not have a .csv in the 999 protocol yet (remember the 999 protocol is the canonical_protocol in the server).

Then, it prepares a NEW_TASKS protocol using the tasks.js files found in the server (after downloading all the server protocols to `jsPsychR/CSCN-server/`). A couple important points:

- This is a bit tricky, as it will use all the tasks in the server that it can found, across all the protocols, and will select the newest one.

- Sometimes there are multiple copies, with different dates and sizes…

- It is important that the server is as clean as possible. With all the OLD non-updated protocols zipped.

To make sure the Github `jsPsychMaker/protocols_DEV/NEW_TASKS/` is up to date, `create_protocol_with_NEW_tasks.R` will UPLOAD CSCN-server/.../NEW_TASKS to the server, and then DOWNLOAD NEW_TASKS to `../jsPsychMaker/protocols_DEV/NEW_TASKS/`

6.3.3 Check canonical protocol DEV

With `000_CHECK_CANONICAL.R` we can check that the canonical protocol in development works and expected.

In the script you can:

- sync `canonical_protocol_DEV/` folder in jsPsychMaker to `999/` in the server
- launch 5 monkeys
- rename the csv files to a fixed date, etc.
- prepare data
- compare with snaphot (WIP)

7 New protocols and tasks

7.1 New protocols

You can create a new protocol in seconds, choosing from the tasks we have already available.

Make sure you have the last version of jsPsychMaker, installing from Github:

```
if (!require('remotes')) install.packages('remotes'); library('remotes')
remotes::install_github("gorkang/jsPsychMaker")
```

7.1.1 List available tasks

You can list available tasks to choose from. You have more details in the section available-tasks.

```
jsPsychMaker::list_available_tasks()
```

```
$tasks
 [1] "AIM"        "Bank"       "BART"        "BNT"        "bRCOPE"
 [6] "CAS"        "Consent"    "ConsentHTML" "Cov19Q"     "COVIDCONTROL"
[11] "CRS"        "CRT7"       "CRTMCQ4"     "CRTv"       "DASS21"
[16] "DEBRIEF"    "DEMOGR"     "EAR"         "EmpaTom"    "ERQ"
[21] "ESM"        "GBS"        "GHQ12"       "Goodbye"    "HRPVB"
[26] "HRPVBpost"  "IBT"        "IDQ"         "IEC"        "INFCONS"
[31] "IRI"        "IRS"        "MDMQ"        "MIS"        "OBJNUM"
[36] "OTRASRELIG" "PBS"        "PRFBM"       "PRFBMpost"  "PSETPP"
[41] "PSPPC"      "PSS"        "PVC"         "PWb"        "REI40"
[46] "Report"     "RSS"        "RTS"         "SASS"       "SBS"
[51] "SCSORF"     "SDG"        "SRA"         "SRBQP"      "SRSav"
[56] "STAI"       "SWBQ"       "WEBEXEC"

$tasks_zip
[1] "/home/emrys/R/x86_64-pc-linux-gnu-library/4.2/jsPsychMaker/templates/tasks.zip"
```

7.1.2 Create a protocol

This will create a fully working protocol in `folder_output`. You can edit `config.js` to adapt the protocol to your needs. See experiment configuration for more details.

```
jsPsychMaker::create_protocol(add_canonical_tasks = c("AIM", "EAR", "IRI"),
                              folder_output = "~/Downloads/TEST/new_protocol",
                              launch_browser = TRUE)
```

7.2 New tasks

7.2.1 Create tasks

There are a number of elements the tasks need to work well with jsPsychR, so we recommend to use one of the systems we have developed.

For example, with `create_protocol()`, you can create new tasks as part of a fully working protocol to be able to test them using `csv` or `xls/xlxs` files for the items and html files for the instructions. You will need R 4.2 or higher to use it.

There are some things to take into account:

- The **tasks_folder** expects a folder with sub-folders with the ShortName of tasks. Inside, they need to have one `csv` or `xls/xlxs` file and `html` files

- The **csv or xls/xlsx file** (ShortName.csv or Shortname.xls/xlsx) needs to have an `ID` and `plugin` columns, and then columns by the name of parameters used in the plugin (e.g. if using the `survey-text` plugin, you will need the `prompt` parameter). If you need **help with the plugins parametes**, see the jsPsych 6.3 list of plugins

- For each **html file** (ShortName_instructions.html, ShortName_instructions2.html, etc) an instructions page will be created. The files need to end with `_instructions.html` or `instructions#.html` (# is a number). If there is no html, a default page will be used

- For **key questions** (e.g. present this question only if participants responded "3"), you need to create a column named `if_question` and include a logical condition. For example:

  - `1 != 25`: Response to item 1 is NOT 25
  - `3 == 20`: Response to item 3 is 20
  - `15 == yes`: Response to item 3 is yes

- If you use tasks with images, video or audio, make sure to include the files in a `media/` folder:

– Images: `media/img`

– Videos: `media/vid`

– Audio: `media/audio`

`create_protocol()` will:

- Loop through the subfolders in `tasks_folder` to create one task per subfolder
- Copy `canonical_protocol clean` to `folder_output`
- Modify `config.js` to add the recently created tasks
- Modify `index.html` to add only the plugins those tasks will use
- Check task names are OK (no spaces, _, -, do not start by a number, …)
- Check only one csv or xls/xlsx file per folder
- Check plugins used exist in jsPsych-6/plugins

You can run the fully reproducible example included in jsPsychMaker. It uses the files from `admin/example_tasks_new_protocol/`.

1) Install jsPsychMaker from Github and load library

```
if (!require('remotes')) install.packages('remotes'); library('remotes')
if (!require('jsPsychMaker')) remotes::install_github("gorkang/jsPsychMaker"); library('js
```

2) Copy example tasks

This will copy a few example tasks that you use to adapt your tasks. For example, `MultiChoice` and `Slider` tasks, a key questions mini-task (`IfQuestion`), and an `ImageButtonResponse` task.

```
# Copy example tasks to local folder
copy_example_tasks(destination_folder = "~/Downloads/TEST")
```

3) Create your protocol

```
# Create protocol
create_protocol(tasks_folder = "~/Downloads/TEST/example_tasks/",
```

```
                    folder_output = "~/Downloads/TEST/new_protocol",
                    launch_browser = TRUE)
```

7.3 HELP with new tasks

If you need help developing new tasks, you can open a new Issue in the jsPsychMaker Github.

We will ask you to add the details about the task in the NEW tasks document.

Once the task is implemented, our goal is to always end up having a sister task preparation script in jsPsychHelpeR. You can try to create the preparation script and do a Pull request, or ask for help opening a new Issue in the jsPsychHelpeR Github.

7.3.1 How to fill the NEW tasks document

———————————————————

NEW tasks document

———————————————————

First of all, you will need the original paper where the task was validated/translated to have all the details at hand. Please, send us a link to the paper.

The best way to fill the NEW tasks document is:

1. Find a task similar to yours in the document Tareas jsPsychR where we have information about all the available tasks.

2. Copy/paste the information from all the tabs to the NEW tasks document and adapt it.

Try to be as consistent as possible. For example, when entering the information about numeric conversion in the Puntajes_items tab:

```
All the cells must be:
1 = Mucho
2 = Poco
...
```

DO NOT do things like:

55

```
1: Mucho
1 Mucho
1 pto = Mucho
Mucho 1
```

Please, make sure you fill out all the details in all the tabs.

References

- jsPsych

- targets

Landau, William Michael. 2021. "The Targets r Package: A Dynamic Make-Like Function-Oriented Pipeline Toolkit for Reproducibility and High-Performance Computing" 6: 2959. https://doi.org/10.21105/joss.02959.