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Introduction to

PsychoPy for Online Studies

How to confidently build
your research online

Who am I?



- Research Intern at LAPSO
- My internship advisor is Dr Sofia Frade
- Graduating with my MSc this summer! (maybe)

*Me every time anyone mentions
creating a behavioral task*



(picture from @HirstRj)

Disclaimer

This workshop uses the PsychoPy
2021.2.3 release.

Workshop Rules

We defer judgment!

We ask questions!

We have fun!

Workshop overview

1

- Online web-based research
- The basics of PsychoPy

2

- Setting up PsychoPy
- Programming a Stroop task
- Setting up Pavlovla

3

- Data collection basics
- Useful resources
- General tips
- Final questions

Goal

Leave today feeling like you could make a cool online experiment in PsychoPy!

Online web-based research

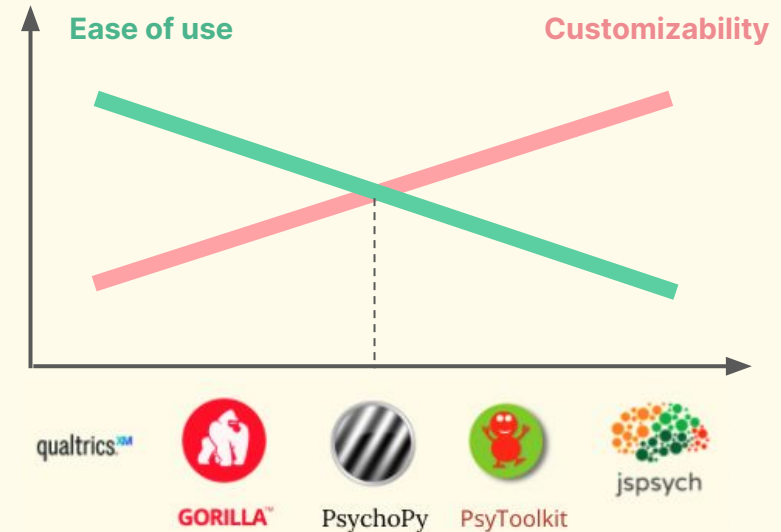
Participants...

- No need to have programs installed
- Can use multi-devices

Researchers...

- Less control
- Less response time precision
- Browser incompatibilities

For illustration purposes:



Free?

No

No

Yes*

Yes

Yes*

*needs hosting services (e.g., Pavlovia).

PsychoPy for online studies

Fully customizable

Great for beginners with Builder interface

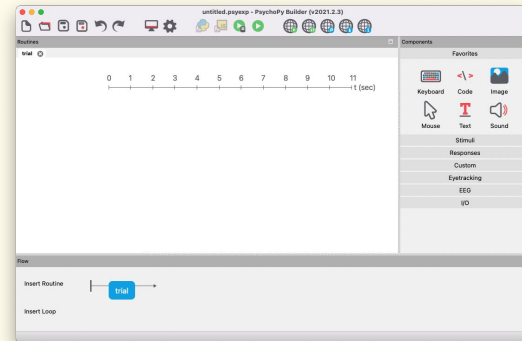
Easy online integration through Pavlovia

- fully GDPR compliant; server located in the UK
- £0.20 (0.24€) per participant *
- Piloting is free (URL is valid for 1h each time)

A large community of users

- Shared experiments ready to use (<https://pavlovia.org/explore>)
- Support provided (<https://discourse.psychopy.org/>)
- Many youtube tutorials and resources provided by creators

*Not affected by
internet quality!*



No coding required!

What PsychoPy supports online

Stimuli

Images (.png, .jpg)

[Movies](#) (e.g., mp4)

Embedded Youtube

Polygons

[Sounds \(stereo\)](#)

Text

Responses

Keyboard

[Mouse click](#), [view](#)

[Text entry](#)

[Form \(scrollable\)](#)

[Slider](#)

[Brush](#)

[Microphone](#)

Flow and Logic

Display logic (with code)

Import condition files

Randomization

*Can connect to
Prolific, Qualtrics,
Sona and MTurk!*

Buttons not supported

Form

☐ Man
☐ Non-binary
☐ In another way
☐ Prefer not to say

How old are you?

Are you a student?

☐ Yes, undergraduate
☐ Yes, taught postgraduate
☐ Yes, research postgraduate
☐ No

Are you fluent in English?

☐ Yes, as a first language
☐ Yes, as a second language
☐ No

Slider

Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree

3

Textbox

Type the target word below, and press return

Mouse click

YES

START

NO

Timing properties

PsychoPy is capable of sub-millisecond reaction time precision online.

Package	Platform	Browser	Reaction times variability (ms)	Visual duration variability (ms)	Audiovisual sync variability (ms)
PsychoPy	Win10	Firefox	1.96	2.42	3.9
PsychoPy	Win10	Chrome	0.39	0.67	3.01
Gorilla	Win10	Firefox	1.11	2.67	1.73
Gorilla	Win10	Chrome	3.58	5.03	15.06

In real life there will be more variability because each participant will have a different **keyboard**.

This study was conducted with a button box through out all combinations.

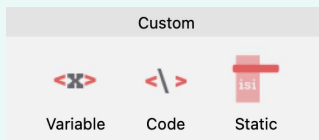
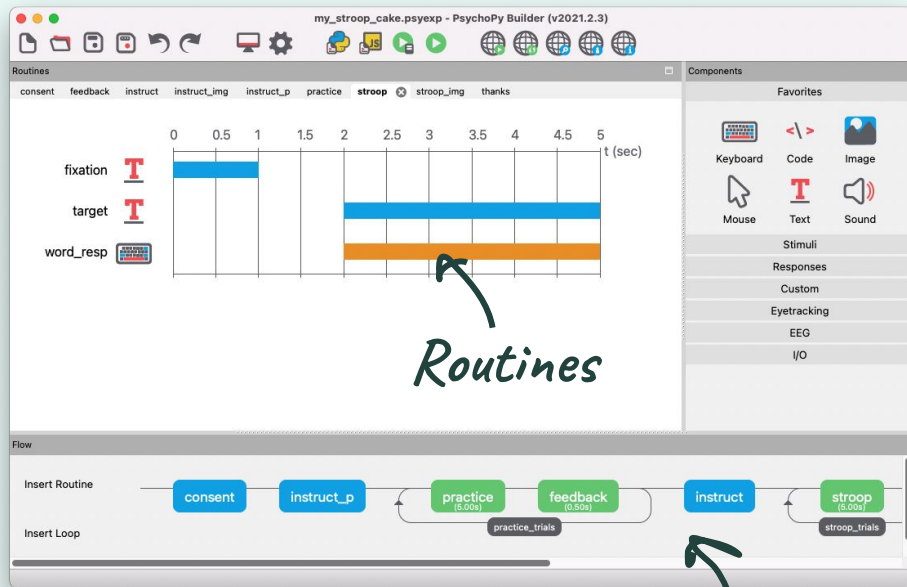
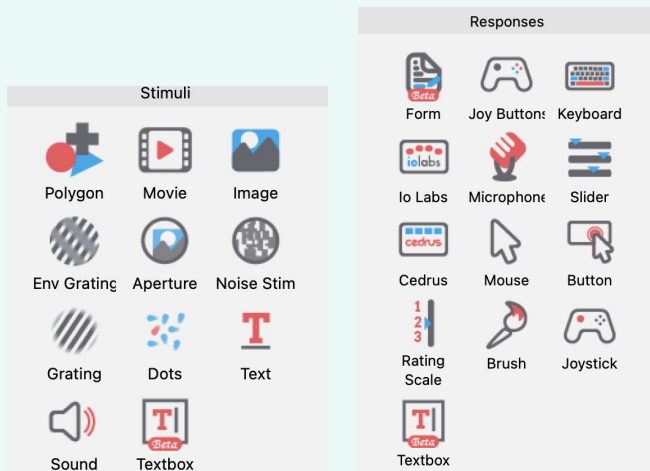
(adapted from Bridges et al., 2020; important to note that this study was conducted by PsychoPy creators)

Setting up PsychoPy

Builder interface

This is our main window.

Everything we need is in here.



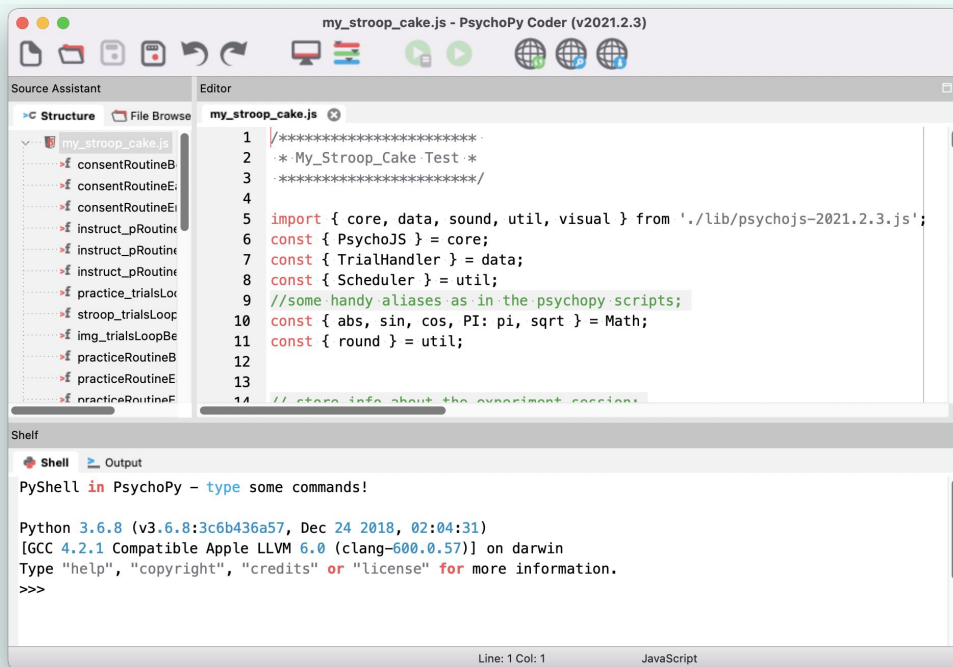
Setting up PsychoPy

Code interface

We don't need this.

Just minimize it.

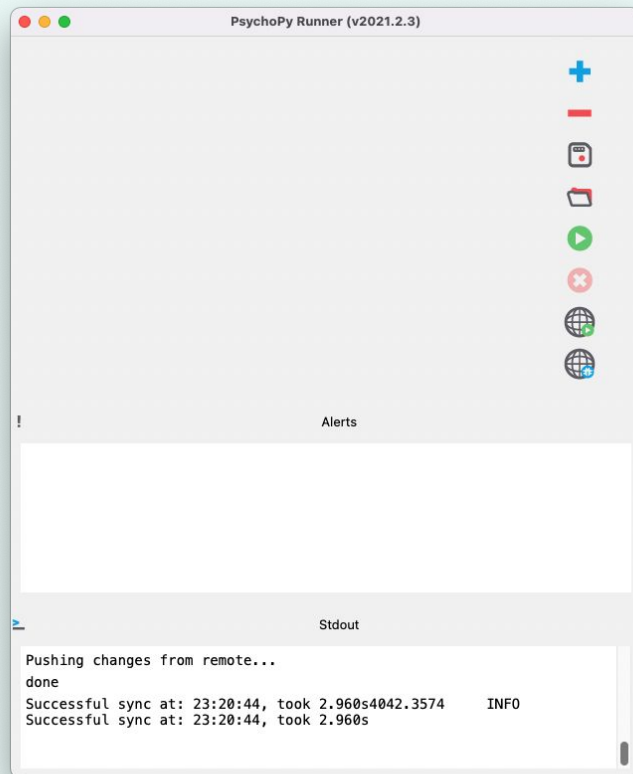
You should not edit anything in the code interface, if you are using the Builder. Otherwise will create conflict.



Setting up PsychoPy

Run interface

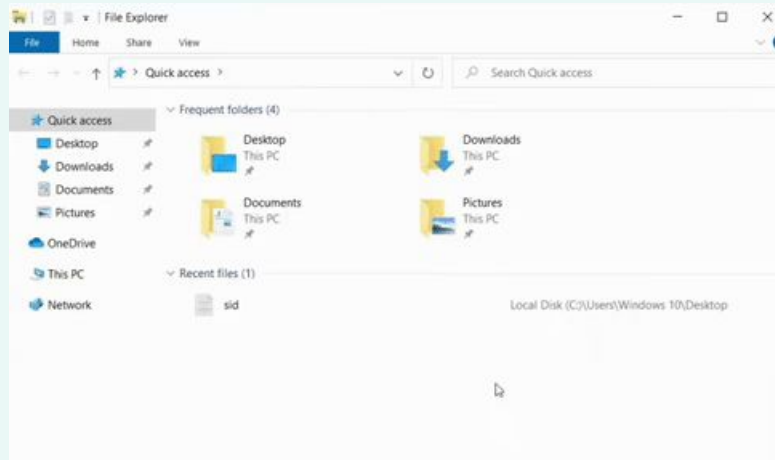
Every time we are going to send our experiment to the web, we need to check this window to this if any error was detected.



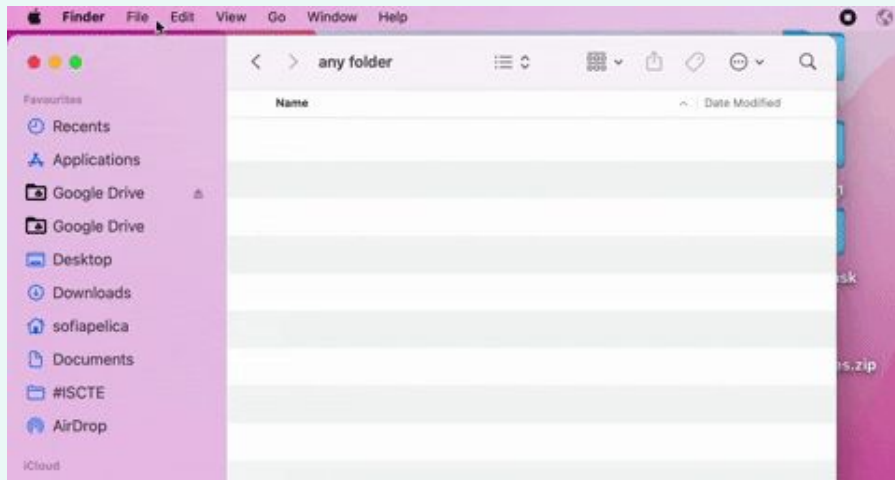
Setting up PsychoPy

Create your experiment folder

Windows: This PC > C: > Users > Folder with your username.



MacOS: Open Finder. Select Go > Home. Create a Folder. Make an alias and drag the alias to desktop.



Setting up PsychoPy



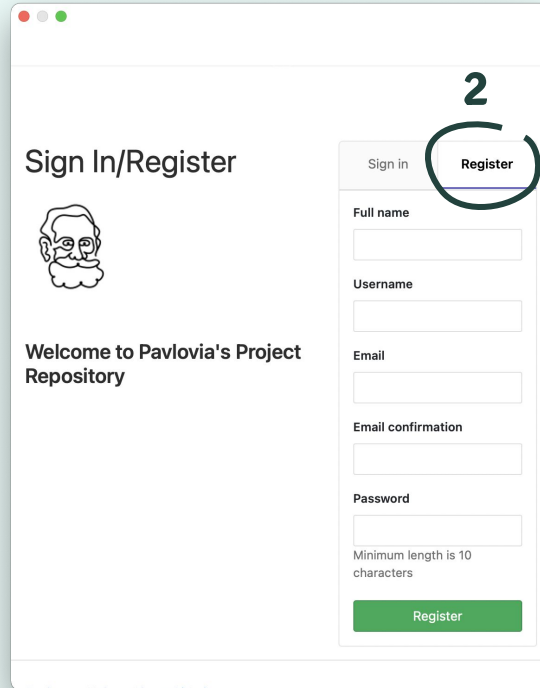
Save your psychopy file.

1. Name it **my_stroop**
2. Place it in your study folder.




- Do not use spaces, symbols or accent marks
- Do not put it inside another folder.
- Do not put it in the desktop.
- Do not put it inside a cloud folder.
- Once submitted online, do not change its place.

Setting up Pavlovía!



Sign In/Register



Welcome to Pavlovía's Project Repository

Sign in **Register**

Full name

Username

Email

Email confirmation

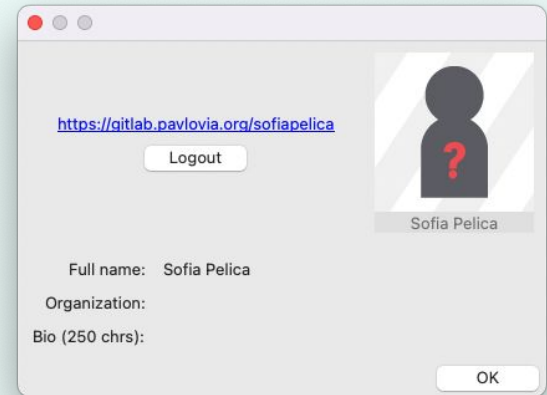
Password

Minimum length is 10 characters

Register


3

After log in you should see this.



<https://gitlab.pavlovía.org/sofiapelica>

Logout


Sofia Pelica

Full name: Sofia Pelica

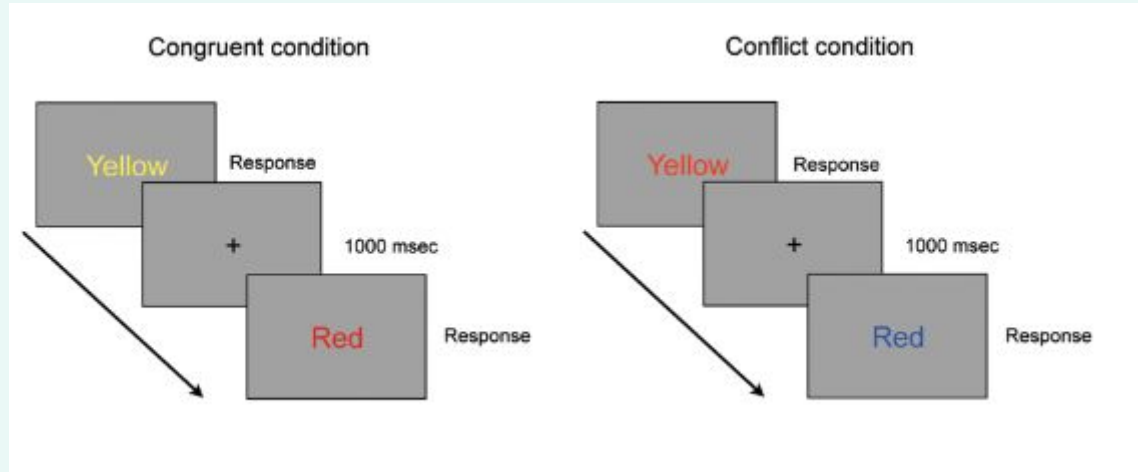
Organization:

Bio (250 chrs):

OK

Hands-on!

Stroop Task



Congruent Condition: The color of the word and the meaning is the same

Conflict Condition: The color of the word and the meaning is different (e.g., “blue” written in red)

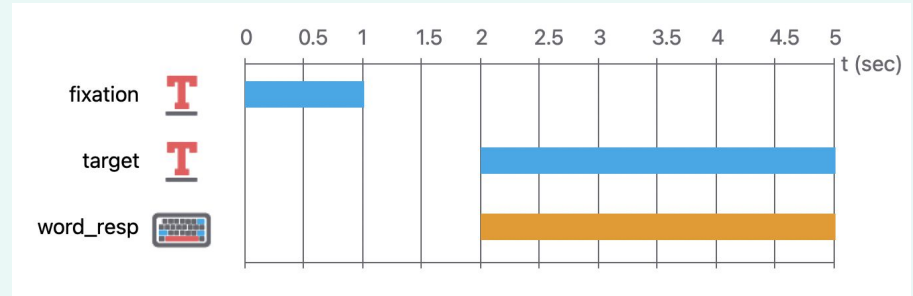
Each stimulus will be presented during 3 seconds or until the subject’s response.

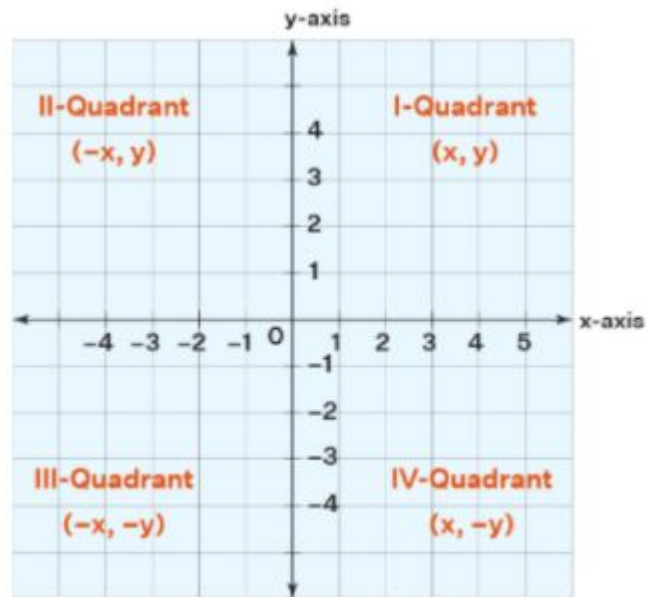
Participants need to respond to the ink of the words (not the meaning).

Left for **red** COLOUR

Down for **green** COLOUR

Right for **blue** COLOUR





Break time
10:00

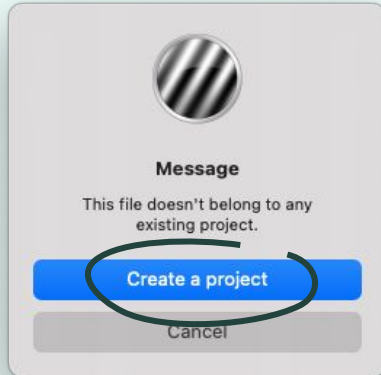


Submit to Pavlovia



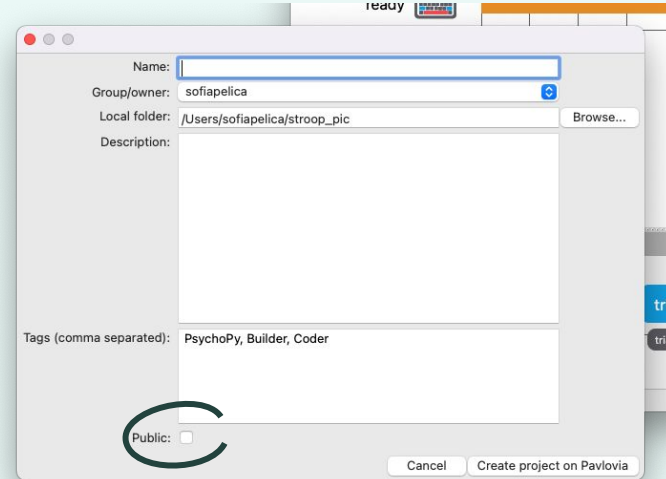
1

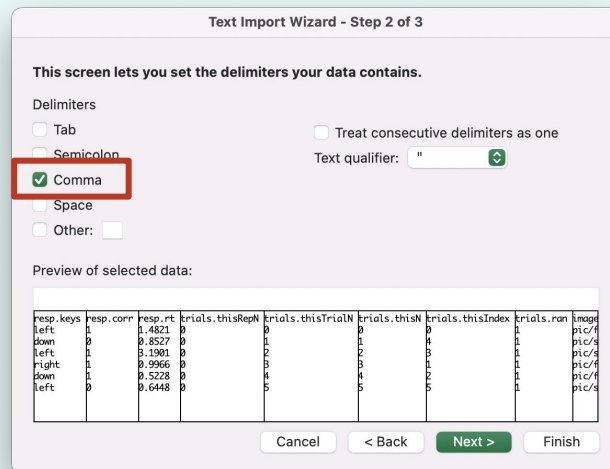
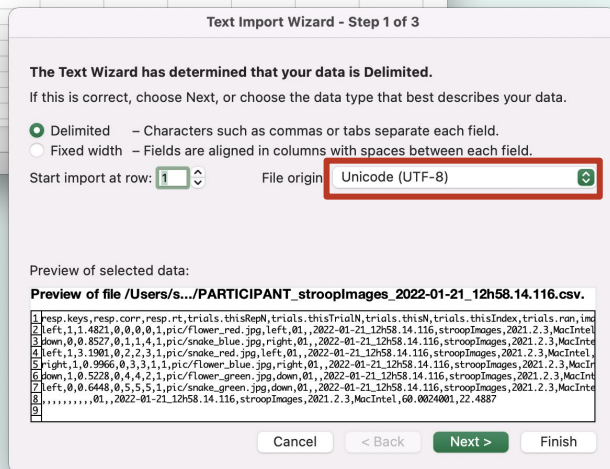
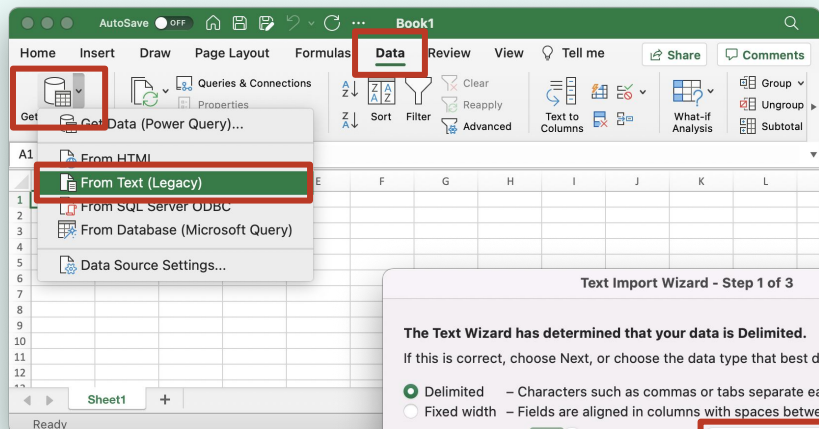
Every time you make changes
and want to update online.



2

3 Give your project an official name





which keys was pressed	participant's correct answers	which repeat you are currently on	which trial number within that repeat	total trials completed so far	the index of the current trial in the original conditions list	How many times this condition row appeared
word_resp.keys	word_resp.corr	stroop_trials.thisRepN	stroop_trials.thisTrialN	stroop_trials.thisN	stroop_trials.thisIndex	stroop_trials.ran
	0	0	0	0	3	1
down	0	0	1	1	6	1
down	0	0	2	2	5	1
down	0	0	3	3	8	1
down	1	0	4	4	1	1
down	0	0	5	5	0	1

From excel file	From excel file	From excel file	From excel file					Date of the starting time of the study.					Reaction time in seconds
words	letterColor	corrAns	congruent	participant	session	age*	gender*	date	expName	psychopyVersion	OS	frameRate	word_resp.rt
green	red	left	0		1	98	male	2022-02-09_07h16.07.095	my_stroop_cake	2021.2.3	MacIntel	60.0024001	
blue	red	left	0		1	98	male	2022-02-09_07h16.07.095	my_stroop_cake	2021.2.3	MacIntel	60.0024001	0.9258
green	blue	right	0		1	98	male	2022-02-09_07h16.07.095	my_stroop_cake	2021.2.3	MacIntel	60.0024001	0.4399
blue	blue	right	1		1	98	male	2022-02-09_07h16.07.095	my_stroop_cake	2021.2.3	MacIntel	60.0024001	0.5641
red	green	down	0		1	98	male	2022-02-09_07h16.07.095	my_stroop_cake	2021.2.3	MacIntel	60.0024001	0.4497
red	red	left	1		1	98	male	2022-02-09_07h16.07.095	my_stroop_cake	2021.2.3	MacIntel	60.0024001	1.3753



Options on saving data

Saving only complete data

- Only charged for completed participants.
- If browser is abruptly closed during the yellow pop-up, it's considered incomplete data. A log file will appear, but not data.

Saving incomplete data

- Charged for every participant who clicks on Start, even if they close the browser right after that.
- Tries to save data when escape is double pressed.

You have reached the end
of the experiment.

Thank you for your time.

↖ *What a correct
saving looks like!*

Options on saving data

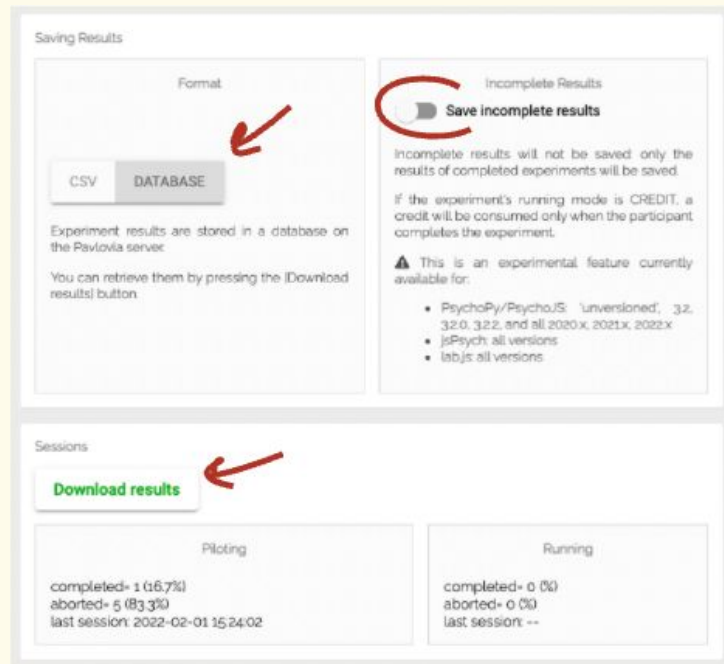
Best option!

Database format

- All participants will be merged into one file.
- They are ordered by date of participation.

CSV format

- Each participant will have a individual file.
- Because PsychoPy only saves variables by order of appearance, you can get columns arranged in different order in each file.
- Number of decimals used differs!



How credits work

Assign credits

- After buying your credits, click RUNNING, and assigned them.
- Now you can use your official URL.



Reserved credits

- Credits are reserved when somebody starts a study.
- Will be consumed when the results are recorded (task completed or browser closed).
- Will be released from its "reserved" status after 24 hours.

*We don't want to leave
this bar in green.*



Some notes on troubleshooting errors

- **Google the error** message with “psychopy”
- **PsychoPy has a forum for discussing errors.** You cannot delete your question afterward.
- **Check your component, trial, or file names** → PsychoPy don’t work with spaces or symbols or too long names. Don’t use default names either (e.g., “trial” for trial, “text” for text component).
- Check if your **experiment folder** is in your home folder.
- **Delete the js and index file** [on your computer] and run it again to force an update.
- **Clean your cookies** on Pavlovia to force an update.
- If PsychoPy don’t acknowledge a new file condition after doing the two previous steps, then you should create a new folder, copy your stimuli, condition files and psyexp file. Associated this to a new project.

Good practices

- **Don't change your PsychoPy version while collecting data or building your experiment!**
Find previous versions here (<https://github.com/psychopy/psychopy/releases>).
- **Write something on every commit.** If your experiment goes wrong, you can find a good version of your experiment and restore it. Pavlovia saves EVERY version of your experiment every time you commit.
- **Fork projects** that you based on instead of download it, so you can acknowledge that person's efforts.
- **Save your data in Database format** instead of CSV. The number of decimals can vary on CSV format.
- **Configure SSH Key on your Gitlab** account to protect from hackers the connection between your computer and Pavlovia's server.

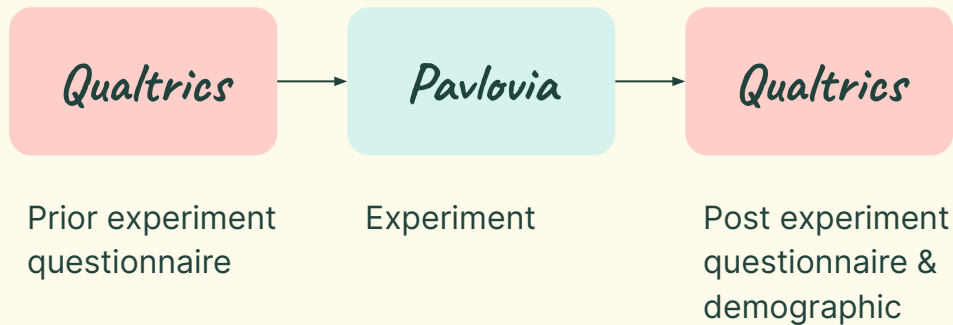
Good practices

- Don't edit your files directly on Gitlab.
- If you started programming your experiment on Builder interface, don't use the Code interface.
- **Run pilot test in different browsers, different computers, and different operating systems.**
- If you are collecting and need to make a change, **wait until dawn to commit your change on Pavlovia.**
- Be aware that **participants tend to close the browser immediately after reading “thank you”.**
So don't ask them to click on their keyboard to end the routine → instead set a timer to end the routine.

Useful resources

- [Demos of online studies](#)
- [PsychoPy Javascript crib sheet](#)
- [PsychoPy Youtube Channel](#)
- [Building Experiments in PsychoPy \(Book\)](#)
- [**Securing Gitlab account with SSH key**](#)

Suggested pipeline



Other suggestions

Measure the participant's total time

Hide mouse cursor

Stop your task from running if the participants is using a mobile phone

Thank you!

Feel free to share any of these materials with others.

Happy to answer questions.

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References

- Bridges, D., Pitiot, A., MacAskill, M. R., & Peirce, J. W. (2020). The timing mega-study: comparing a range of experiment generators, both lab-based and online. *PeerJ*, 8, e9414. <https://doi.org/10.7717/peerj.9414>
- Oh, J., Han, M., Peterson, B. S., & Jeong, J. (2012). Spontaneous Eyeblinks Are Correlated with Responses during the Stroop Task. *PLoS ONE*, 7(4), e34871. <https://doi.org/10.1371/journal.pone.0034871>
- Shibasaki, M., Isomura, T., & Masataka, N. (2014). Viewing images of snakes accelerates making judgements of their colour in humans: red snake effect as an instance of 'emotional Stroop facilitation.' *Royal Society Open Science*, 1(3), 140066. <https://doi.org/10.1098/rsos.140066>

To find out more about taking your research to the next level...



LAPSO

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Edifício II, piso 0, sala D009

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