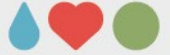


PsychoPy

Sebastian Jentschke

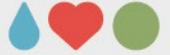




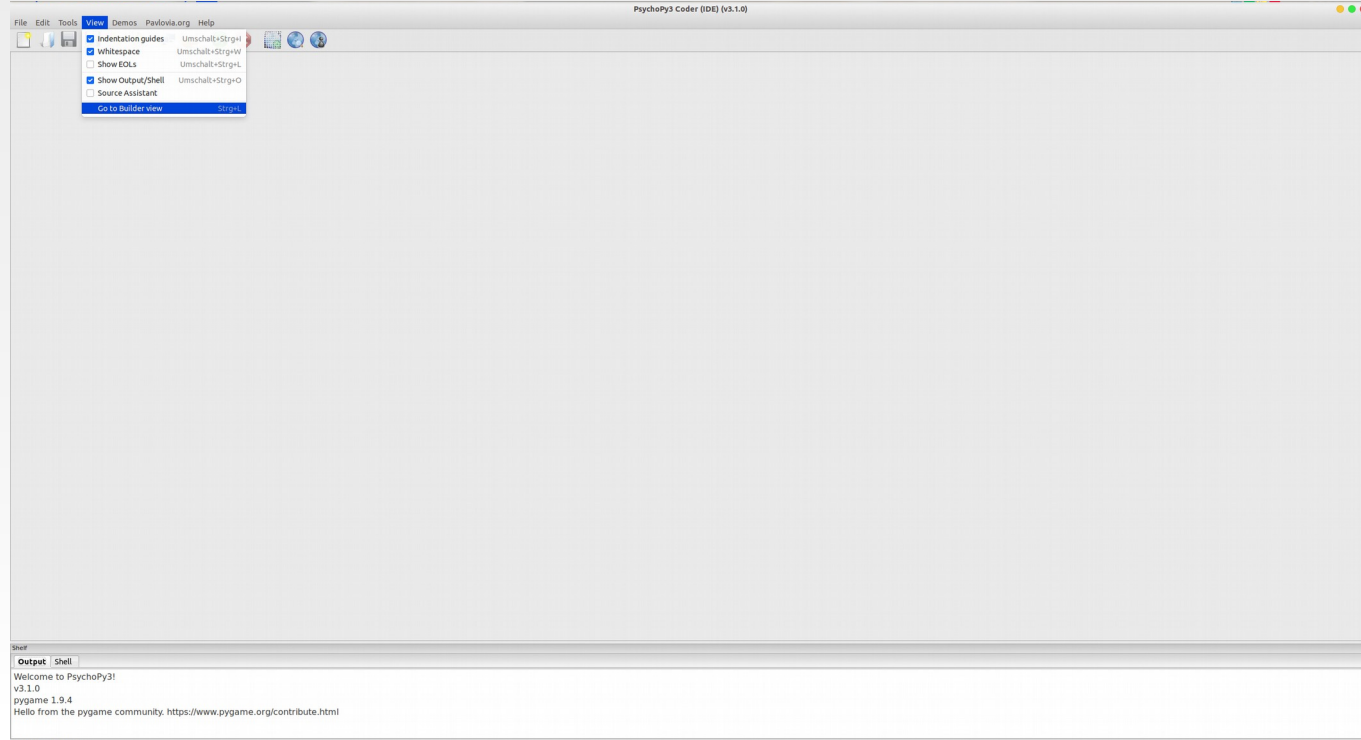
PsychoPy

- Python-based software for running experiments
- all major platforms (Win, Mac, Linux)
- preliminary support for online experiments
- precise timing
(«PsychoPy can achieve high levels of precision and accuracy in the presentation of brief visual stimuli»; Garaizar & Vadillo, PLOS 2014)
- GUI (Builder) and scripting (Coder)
- free and open-source (www.psychopy.org)



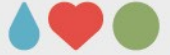


PsychoPy



Go to the Builder view





PsychoPy

untitled.psyexp - PsychoPy Builder

File Edit Tools View Experiment Demos Pavlova.org Help

trial

Settings Publish / run the study online

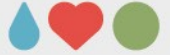
New Compile
Open Run
Save Stop
Save as...

Components
Favorites
Stimuli
Responses
Custom
I/O

Flow
Insert Routine
Insert Loop

trial





PsychoPy

- routines
 - stimuli (**text, images, sounds, videos;** noise, dots, polygons [all: + aperture + grating])
 - responses (**keyboard, rating, slider, mouse;** [sound] recording)
 - custom (**code, variable;** static [waiting, e.g., to load image])
 - I/O (parallel port)
- loops





PsychoPy

untitled.psyexp – PsychoPy Builder

File Edit Tools View Experiment Demos Pavlovia.org Help

trial

0 1 2 3 4 5 6 7 8 9 10 11 (sec)

Components

- Favorites
 - [Icon]
 - [Icon]
 - [Icon]
- Stimuli
- Responses
- Custom
- I/O

Flow

Insert Routine

(new) trial

trial

Select a Routine to insert (Esc to exit)





PsychoPy

The screenshot displays the PsychoPy Builder interface. The main window is titled "untitled.psyexp - PsychoPy Builder" and features a menu bar with "File", "Edit", "Tools", "View", "Experiment", "Demos", "Pavlovia.org", and "Help". Below the menu is a toolbar with various icons for file operations, navigation, and editing. The central workspace shows a timeline from 0 to 11 seconds, with a red box labeled "trial" positioned at the beginning. To the right, a "Components" panel lists "Favorites", "Stimuli", "Responses", "Custom", and "I/O". At the bottom, a "Flow" diagram shows a single "trial" component with a context menu open, offering "remove" and "rename" options.





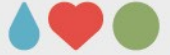
PsychoPy: Components

The screenshot shows the PsychoPy Builder interface. A 'text Properties' dialog box is open, displaying various settings for a text component. The 'Name' field contains 'text'. The 'Start' is set to 'time (s)' at 0.0, and the 'Stop' is set to 'duration (s)' at 1.0. The 'Color' is 'white', 'Font' is 'Arial', 'Letter height' is 0.1, and 'Position [x,y]' is (0, 0). The 'Text' field contains 'Any text including line-breaks'. The 'OK' button is highlighted with a red box. In the background, the 'Components' panel is visible, with the 'Text' component icon highlighted by a red box and a red arrow pointing to it. The 'OK' button in the dialog box is also highlighted with a red box.

2. Adjust settings and confirm with «OK»

1. Click on component (e.g., Text) to add it

Select a Routine to insert (Esc to exit)

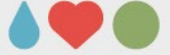


PsychoPy: Components

The screenshot shows the PsychoPy Builder interface. The main window is titled "untitled.psyexp - PsychoPy Builder". The menu bar includes File, Edit, Tools, View, Experiment, Demos, Pavlovia.org, and Help. The toolbar contains various icons for file operations, editing, and running. The main workspace shows a trial timeline from 0 to 1 second. A red box highlights a "text" component (represented by a large 'T' icon) that has been added to the timeline. The timeline is a blue bar with a scale from 0 to 1 (sec). The "Components" panel on the right shows "Favorites" with three icons, and "Stimuli", "Responses", "Custom", and "I/O" sections. The "Flow" panel at the bottom shows a diagram with a red box labeled "trial" connected to "Insert Routine" and "Insert Loop" options. The status bar at the bottom says "Select a Routine to insert (Esc to exit)".

3. Text component added
(right-click on component for changes
[edit *settings*, rename, remove, etc.])





PsychoPy: Components

The screenshot displays the PsychoPy software interface. At the top, there is a menu bar with options: File, Edit, Tools, View, Experiment, Demos, Pavlovia.org, and Help. Below the menu is a toolbar with various icons for file operations and editing. The main workspace shows a trial timeline for a component named 'text'. The timeline is a horizontal bar from 0 to 1 second, with a red 'T' icon at the start. To the right of the workspace are three component palettes. The first palette, titled 'Components', has a 'Favorites' section highlighted with a red box, containing icons for a red 'T' and a green circle. The second palette, also titled 'Components', has a 'Stimuli' section highlighted with a red box, containing icons for a grayscale checkerboard, a red 'T', a landscape, a grayscale sine wave, a grayscale gradient, a green circle, a landscape with a red plus sign, and a game controller. The third palette, titled 'Components', has a 'Responses' section highlighted with a red box, containing icons for a mouse, a keyboard, a rating scale, a game controller, a keyboard with a red plus sign, a game controller, a mobile phone, and the 'cedrus' logo. Below the workspace is a 'Flow' section with a diagram showing a red box labeled 'trial' between two arrows. At the bottom, there are instructions: 'Select a Routine to insert (Esc to exit)' and 'Select a Routine to insert (Esc to exit)'. A circular stamp with the text 'STATS' is visible in the bottom right corner.

Click on Favorites, Stimuli, etc. to see more components

Select a Routine to insert (Esc to exit)
Select a Routine to insert (Esc to exit)
Select a Routine to insert (Esc to exit)

PsychoPy: Text

Basic | Advanced

Name:

Start:
Expected start (s):

Stop:
Expected duration (s):

Color:

Font:

Letter height \$:

Position [x,y] \$:

Text:

Help OK Cancel



- duration can be left empty (needs keyboard for termination)
- Text can be a fixed text or a variable
- letter height and position should be chosen to not overlap
- font should be chosen to be a standard one





PsychoPy: Images

Basic: Advanced

Name

Start
Expected start (s)

Stop
Expected duration (s)

Image

Position [x,y] \$

Size [w,h] \$

Orientation \$

Opacity \$

disabled

saveStartStop

syncScreenRefresh

Units

Help OK Cancel

- duration can be left empty (needs keyboard for termination)
- image can be a file name or a variable (constant vs. set every trial)
- position and size should be chosen to not overlap
- orientation (degrees) and opacity (0 – 1; 1 = solid)

PsychoPy: Keyboard

Basic

Name

Start Expected start (s)

Stop Expected duration (s)

Force end of Routine

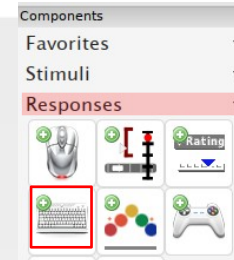
Allowed keys \$

Store

Store correct

Discard previous

sync RT with screen



- duration can be left empty
- tick «Force end of Routine»
- multiple allowed key (comma-separated)
- font should be chosen to be standard
- store: nothing, first/last/all key(s)

PsychoPy: Rating

Basic Advanced Custom

Name

Start Expected start (s)

Stop Expected duration (s)

Visual analog scale

Category choices

Scale description

Lowest value \$

Highest value \$

Labels

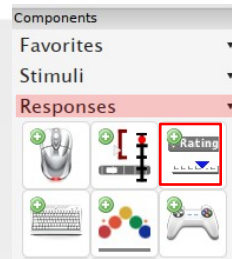
Marker start

disabled

Marker type

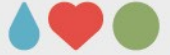
saveStartStop

syncScreenRefresh



- stop can be left empty
- tick «Force end of Routine» (under Advanced)
- (numerical) lowest, highest, start
- labels at lowest, highest
- store: nothing, history (Adv.)
- untick «Show accept» (Adv.)





PsychoPy: Experiment Settings

remove «session» if not required
possible add characteristics you want to store (age?, gender?)

tick excel + summaries
untick log file

background:
(0,0,0) – grey
(-1,-1,-1) – black
(1,1,1) – white

Color: $[\$[0,0,0]]$

Window size (pixels) $[\$ [1920, 1080]]$

Color space: rgb

Units: height

Show mouse:

Blend mode: average

Monitor: testMonitor

Screen: 1

Full-screen window:

Data filename $[\$ ["participant", expName, ex$

Save excel file:

Save csv file (summaries):

Save csv file (trial-by-trial):

Save psydat file:

Save log file:

Logging level $[\$ exp]$

Experiment name:

Show info dialog:

Experiment info:

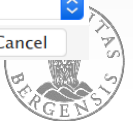
Field	Default	+	-
participa		<input type="checkbox"/>	<input type="checkbox"/>
session	001	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Enable Escape key:

Force stereo:

Use PsychoPy version:

Buttons: Help, OK, Cancel

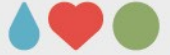




PsychoPy: Questionnaires

- **instruction(s):** text(s) + keyboard (self-paced end)
- loop over **questionnaire items**
 - text (possibly image with prepared graphics to ensure independence from fonts) + keyboard or rating
 - Bergen Insomnia Scale
<https://helse-bergen.no/seksjon/sovno/Documents/BERGENINSOMNIASCALE1.pdf>
 - Excel / CSV file with items
- **thank you and goodbye:** text(s) + keyboard





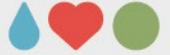
PsychoPy: Questionnaires

- size and position for question and response instructions
- response format and instructions
is there always the same response (not at all ... very much) or does it need to be variable?
- better use keyboard or rating?
- which responses should be stored?





**Assignment 1:
Create a
questionnaire
yourself!**



PsychoPy: Experiments

- **instructions**
- loop over **practice trials** (with feedback)
 - item presentation
 - feedback
- loop over **experimental trials** (without feedback)
 - item presentation, acquiring responses, possibly feedback (see next slide for an implementation)
- **thank you and good bye**



PsychoPy: Code

Basic

Name

Start (time (s))
Expected start (s)

Stop (duration (s))
Expected duration (s)

Force end of Routine

Allowed keys \$ constant

Store

Store correct

Correct answer

Discard previous

sync RT with screen

Help OK Cancel

define correct answer in key-board component

PAGE 20

Components

- Favorites
- Stimuli
- Responses
- Custom

Name Code Type

Begin Experiment * Begin Routine * Each Frame End Routine

```

if resp.corr: #stored on last run routine
    feedback_2.setImage('correct.jpg')
    feedback_2.size = 0.2
else:
    feedback_2.setImage('wrong.jpg')
    feedback_2.size = 0.2

```

Help OK Cancel

the code component can be used to give feedback about correct or incorrect responses; here by assign. an image one of two image files





**Assignment 2:
Discuss and
(possibly) create a
brief experiment!**



PsychoPy: Online experiments

- register at pavlovia.org

← → ↻ 🏠 <https://pavlovia.org>

About Explore Create News Dashboard **Sign In/Register**

Sign in **Register**

Full name

Username


Email

Email confirmation

Password

Minimum length is 8 characters

Register


Pavlovia
/pævlɒviə/
noun. where behaviour is studied





PsychoPy: Online experiments

- login from within PsychoPy:

File Edit Tools View Experiment Demos Pavlovia.org Help

rtnEnd rtnIns rtnTrl

txtEnd

keyEnd

Flow

Insert Routine
Insert Loop

rtnIns

rtnTrl

rtnEnd

repTrl

Sign In/Register



Welcome to Pavlovia's Project
Repository

Sign in

Register

Username or email

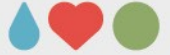
Password

Remember me

[Forgot your password?](#)

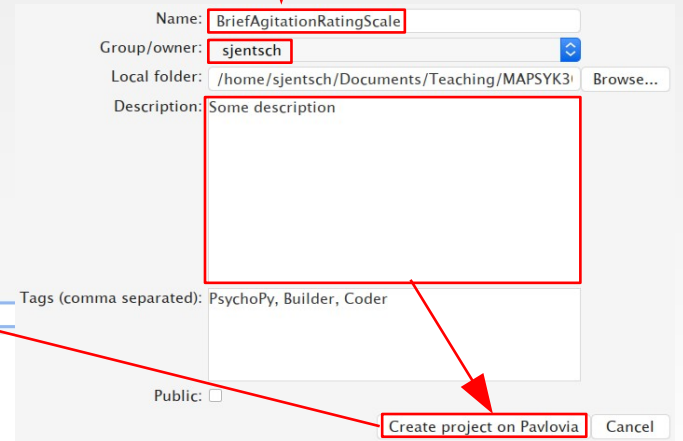
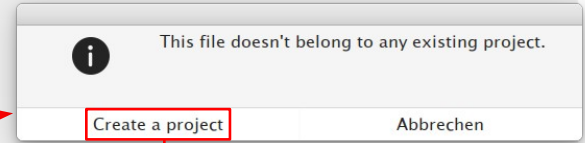
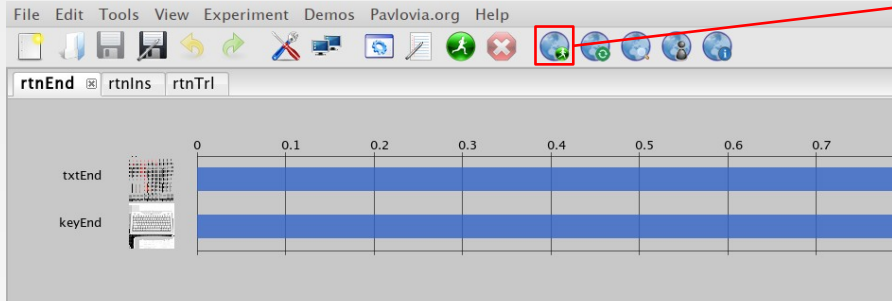
Sign in

[Explore](#) [Help](#) [About GitLab](#)



PsychoPy: Online experiments

- submit the project to pavlovia.org:



Changes to commit:
New: 22 files

Summary of changes
Details of changes (optional)

First commit

Tags (comma separated): PsychoPy, Builder, Coder

Public:

Create project on Pavlovia Cancel



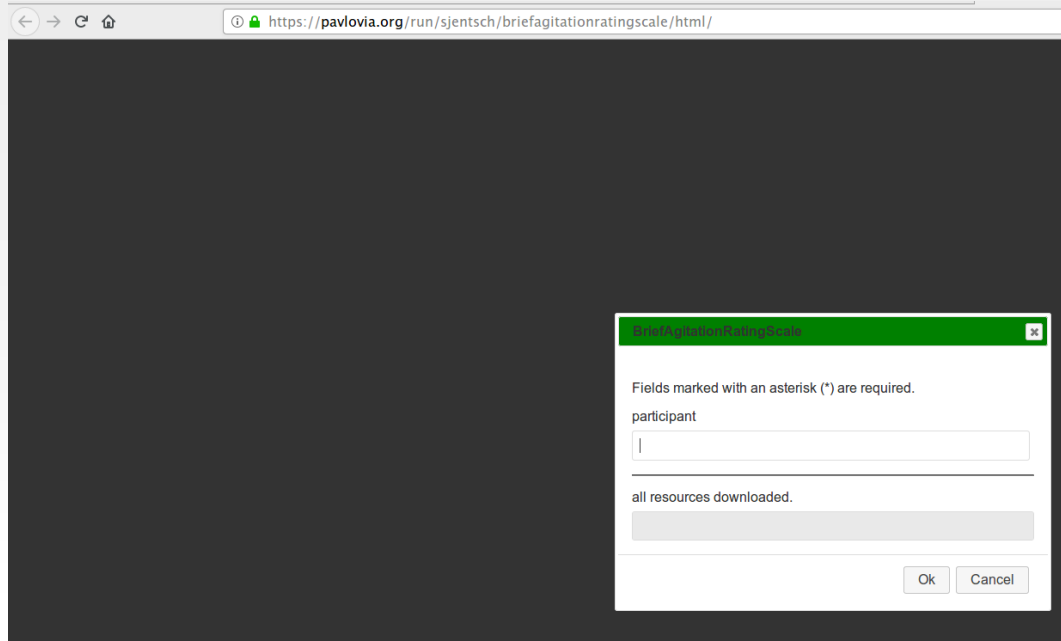
Abbrechen OK





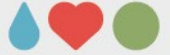
PsychoPy: Online experiments

- run the project at pavlovia.org



Tusen takk for
svarene og din
deltakelse!

Fortsett med
mellomromtasten



PsychoPy: Literature and help

- Peirce, J., & MacAskill, M. (2018). *Building Experiments in PsychoPy*. London, UK: Sage Publications.
- <https://www.psychopy.org/documentation.html>
- <https://discourse.psychopy.org/>





**Thank you for your
interest and your
attention!**