

Sensory Preconditioning experiments

Polymodal Cages

Last update : July 2022 – Hazim Eldirdiri

Needed material

Biological material	Polymodal cages	Software
Mouse	(TO add if photometry/opto/ephys TTL is needed) 473 nm laser source[Thorlabs] 593 nm laser sourcePatch Cords Fiber cables Arduino-Uno boardsWebcam	- iSPY (Camera) - POLY - POLYFILES - Arduino IDE 1.8.15 - Bonsai 2.6.2

Safety Information – For more information, look at the complete safety data sheet

General Rules: *is POLY imagine ref.*

the idea is to minimize the stress and disturbance of internal state of the animal as much as possible.

- change gloves; between WT and KO;
- clean in between.....
- Use different weight things
- to mark; you touch the tail, and not press.. then the animal is ok
-



Figure 1

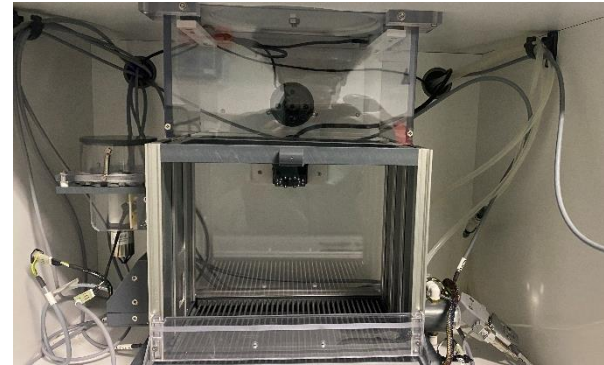
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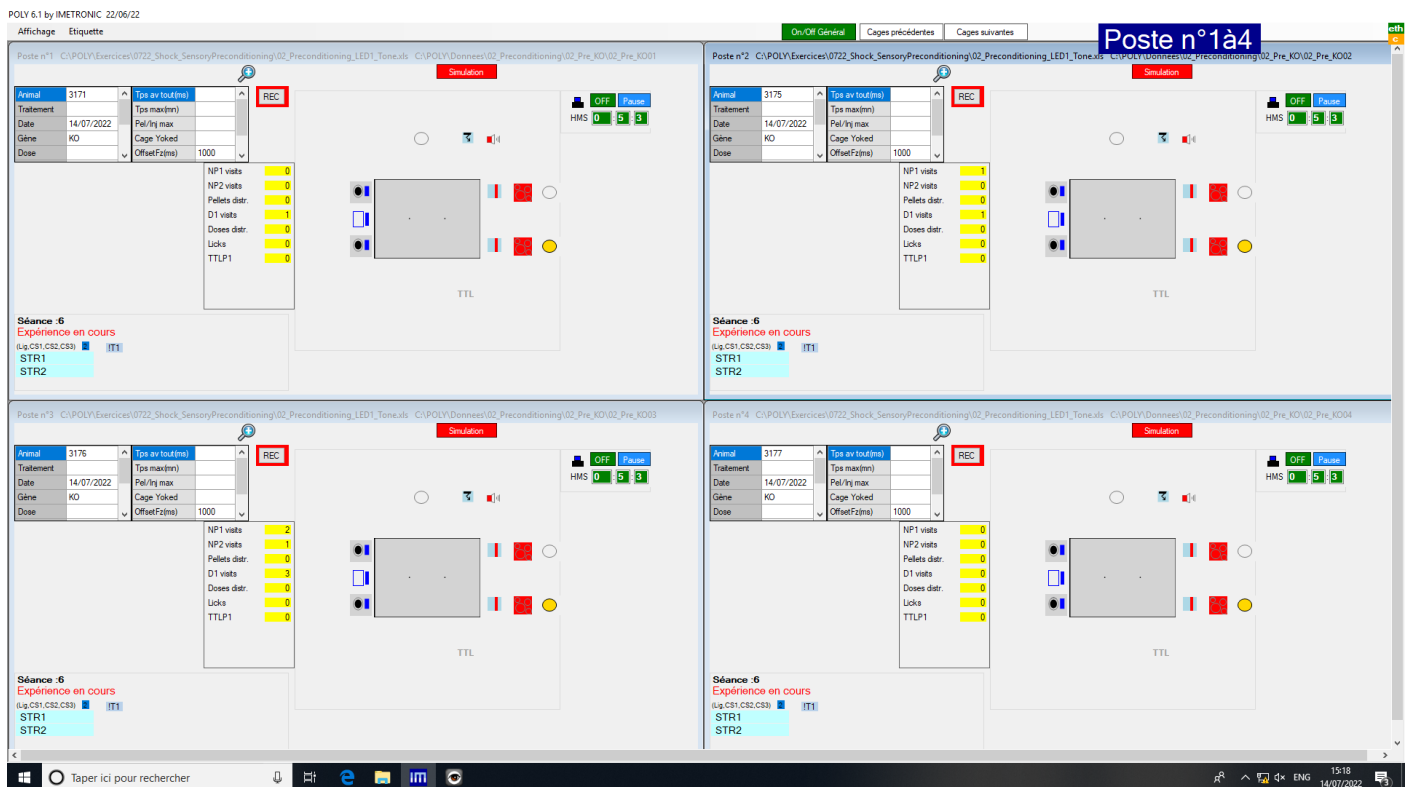
Polymodal Cages Preparation

- Turn on the computer and the Polymodal cages unit
- Make sure the postes are well connected and clean

In the desktop/, make sure all required files are there



- 1) Open **iSPY** software to load the cameras;
 - o Confirm all is working and detecting.
 - o Minimize into tray
 - 2) Open **POLY**
 - o It will load for a bit; and open a screen with the 4 postes
- (Picture 1.2)
Confirm it is POLY 6.1 by IMETRONIC 20/06/22



As you can see the interface is divided into 4 Postes 1 to 4; which correspond to the cages
 Simply the idea here is to

- 1) load an exercise
- 2) Configure animals
- 3) Save/Load a session file

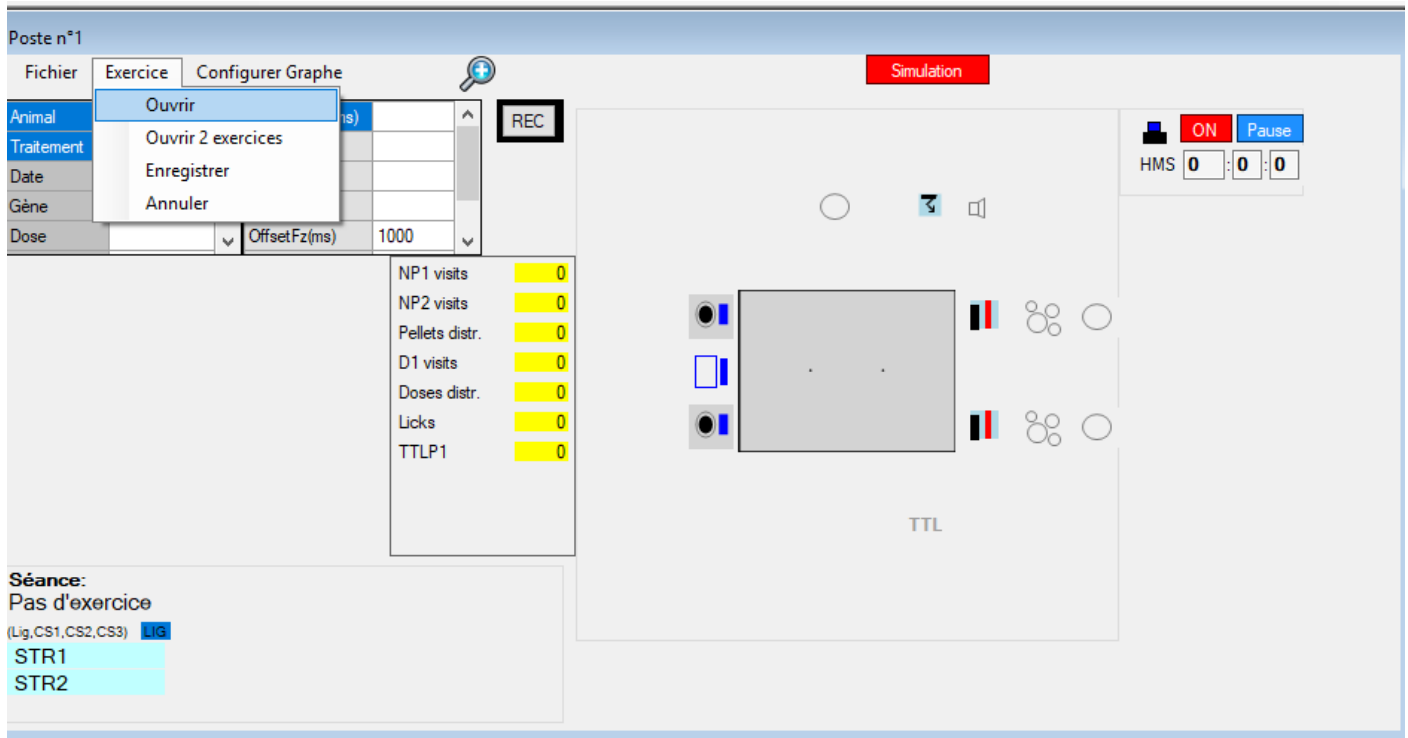
Within that a lot of repetition; yet careful attention to the details

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Configure Experiment

Now let's run a test; into one post



- 1) Press Exercise >>Ouvrir: **SELECT THE EXERCISE YOU'RE DOING**

C > Windows (C:) > POLY > Exercices > 0722_Shock_SensoryPreconditioning

Nom	Modifié le	Type	Taille
01_Habitation	11/07/2022 10:04	Microsoft Excel 97...	
02_Preconditioning_LED1_Tone	11/07/2022 10:41	Microsoft Excel 97...	
03_Conditioning_Paired_LED1_Shock0.4	11/07/2022 10:44	Microsoft Excel 97...	
04_ProbeTest_LED3'ON3'OFF	11/07/2022 10:46	Microsoft Excel 97...	
05_ProbeTest_Tone3'ON3'OFF	11/07/2022 10:47	Microsoft Excel 97...	
GUIDE_Manual_HA	12/07/2022 12:00	Document texte	
protocol	11/07/2022 10:49	Document texte	
test	01/07/2022 13:11	Microsoft Excel 97...	

- e.g: 02_Preconditioning_LED1_Tone.xls Now a tone is to be coupled to a light for [add protocol details]10 of the seconds; in this exercise it is repeated for 6 sessions.
- In C:/POLY>IMETRONIC/ Test_tout.xls This is to test all the components of the cages (Nose Poke NP, Distiller D, Shock, Sound, LED/HLED)

* Refer to the manual [Polymodal user guide_marsicano2022] for further details

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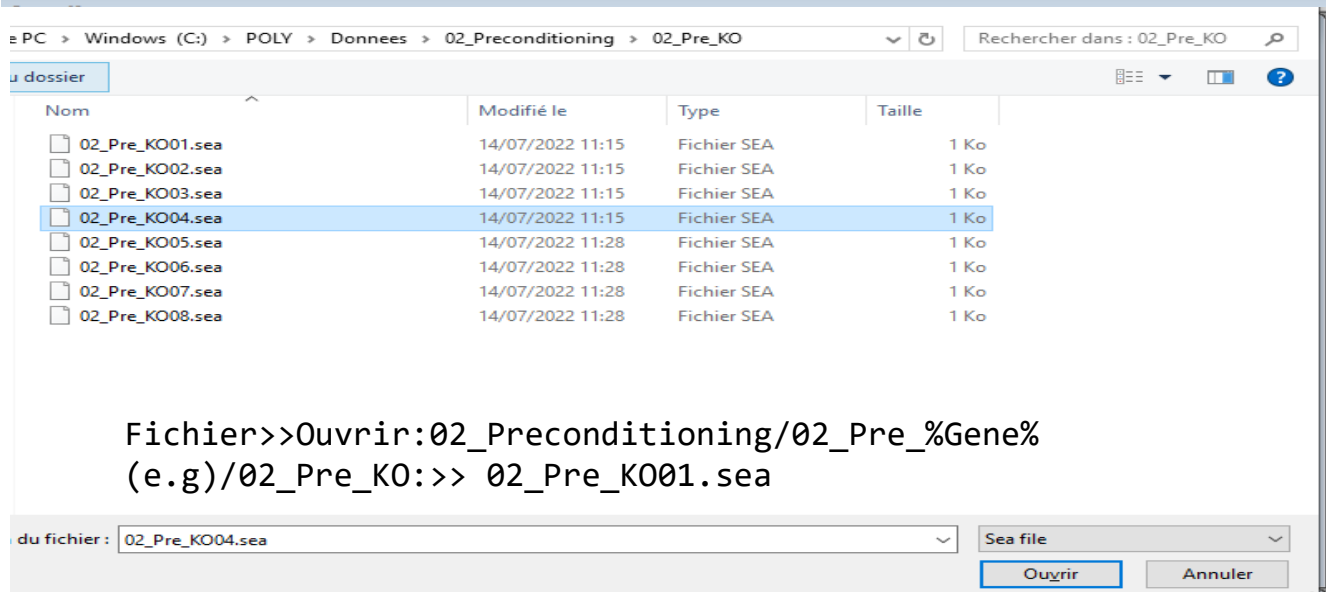
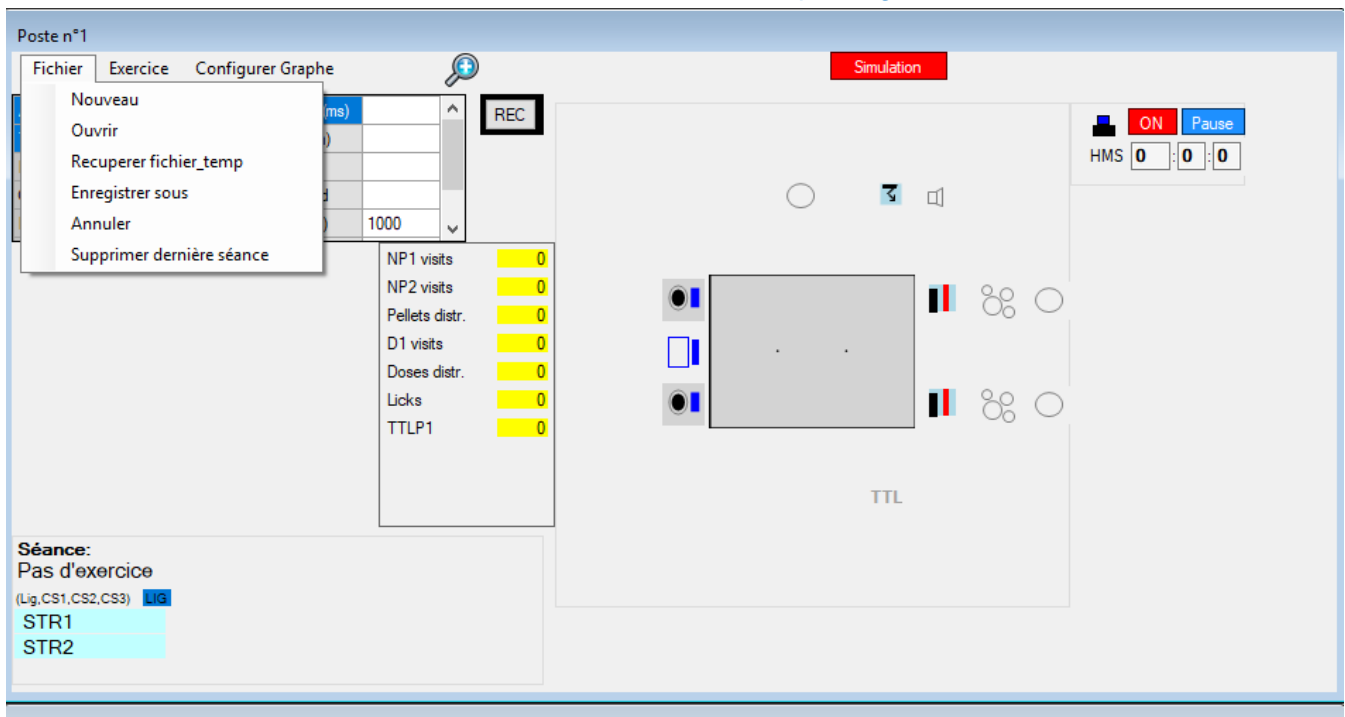
- CONFIRM EXERCISE IS WELL WRITTEN; and loaded.

En ms	T1	T2	T3	^	HLED	LED1	LED2	NP1	NP2	D1	LK1	LK2	REC	RD	ASND	ASHK	STR1	STR2	TTLP1	OD1	OD2	^	NEXT1	NEXT2	NEXT3	^	
1	180000	_H1											ON											IT1			
2	30000	_IT				ON									ON(3...									IT1			
3	30000	_IT1				ION									ION									IT1(2)	CTT=5		
4	60000	_H2																						IT1			
5																											
6																											
7																											
8																											
9																											
10																											

2) Next Step is to configure the animal sessions.

Each session can be loaded; You have to individually load in each box the correct ones: e.g:
Poste 01:

Fichier>> **Nouveau** [if for the first time]; **Ouvrir** [If repeating a session]



Fichier>>Ouvrir:02_Preconditioning/02_Pre_%Gene%
 (e.g)/02_Pre_K0:>> 02_Pre_K001.sea

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3) a box will come up: it says {Séances précédentes...}

Séance(s) précédente(s)

Numero de la séance:

Informations expérience:

Animal	3175
Traitement	
Date	14/07/2022
Gène	KO
Dose	
Voie	
Solvant	
Produit2	
Lésion	
Remarque	

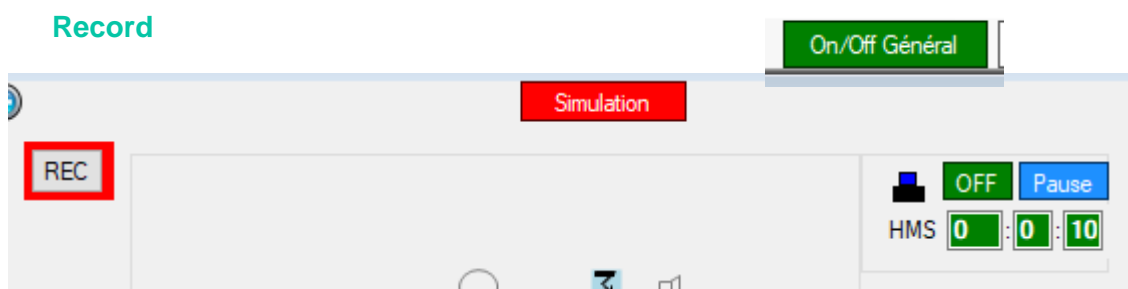
Valeur(s) des compteurs d'états
séance(s) précédente(s)

NP1 visits=0
NP2 visits=2
Pellets distr.=0
D1 visits=4
Doses distr.=0
Licks=0
TTLP1=0

Confirm Animal ID, Date and Gene [Wt vs. KO]

Repeat iPoste:nPostes

Etiquette: Modify Date and confirm gene.



NOW ALL your configuration is ready; you confirm all is well written

And confirm your timing.. SET ON/OFF General and start recording

Prêt pour séance :6

(Lig,CS1,CS2,CS3) **LIG**

STR1

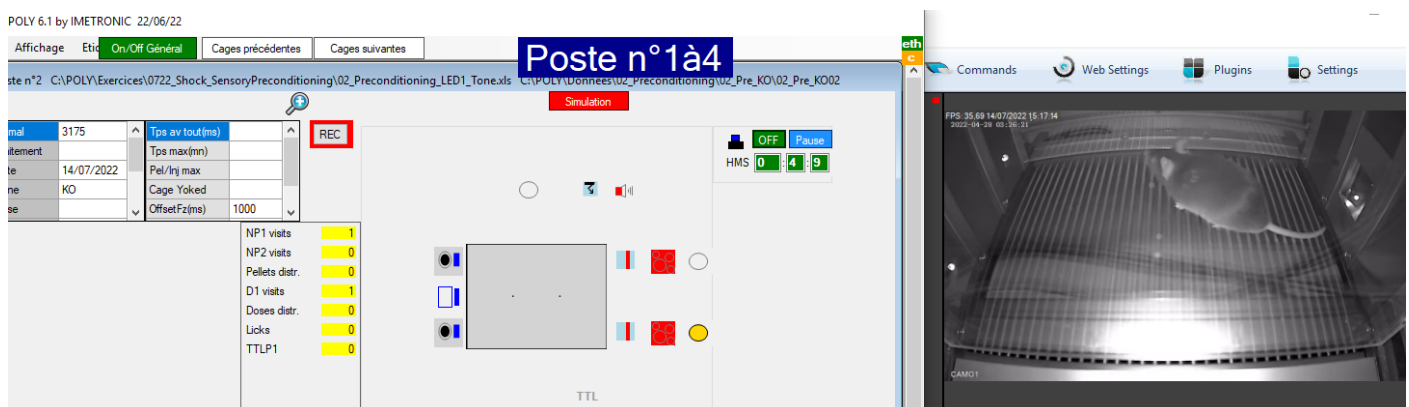
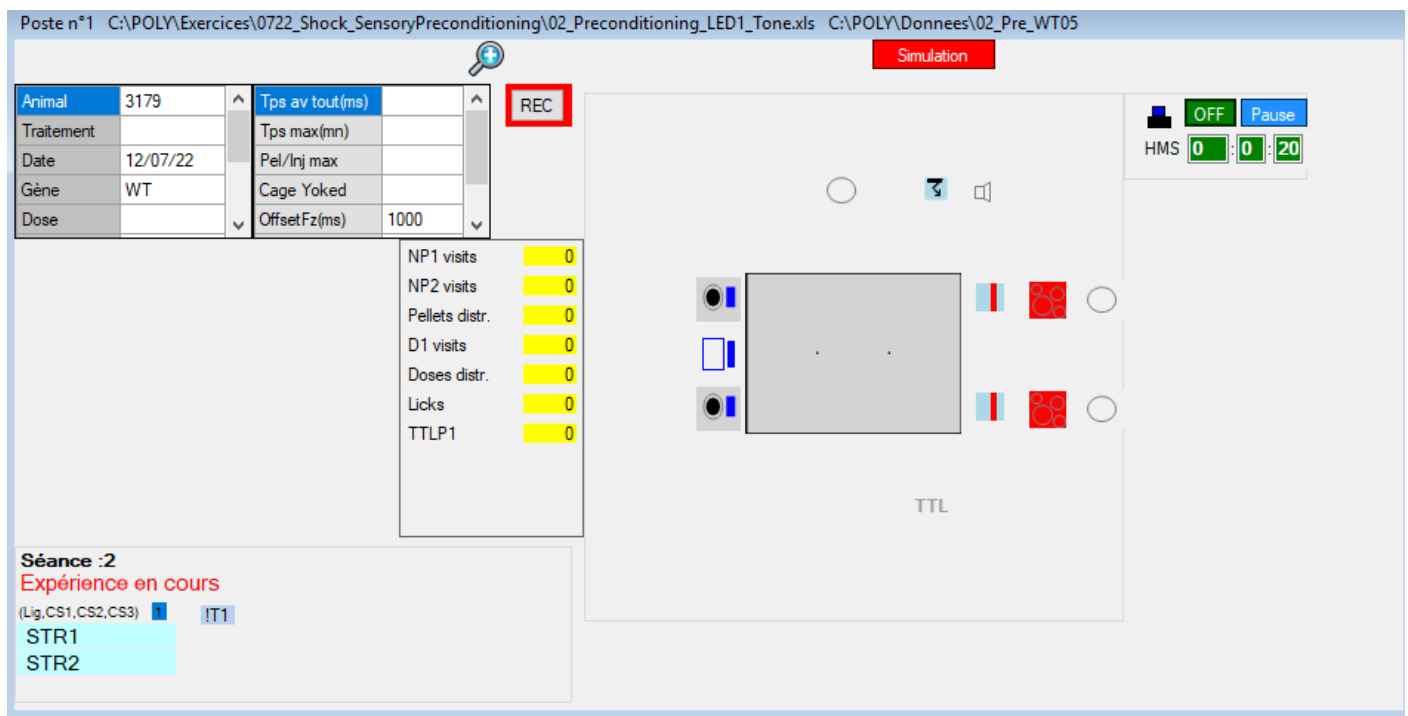
STR2

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To confirm the experience is recording and saving;

- 1) Pret pour experience changes into : Experience en cours
- 2) The video starts recording ; don't try to touch it; just observe, and don't press REC from the software; it is already encoded in the exercise



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The screenshot shows a Windows File Explorer window with the address bar indicating the path: > Ce PC > Windows (C:) > POLY. The left sidebar shows the 'Accès rapide' (Quick access) section with 'Ce PC' selected. The main pane displays a list of files and folders in the 'POLY' directory. The 'Exercices' folder is highlighted in blue.

Nom	Modifié le	Type	Taille
Donnees	12/07/2022 14:01	Dossier de fichiers	
Exercices	12/07/2022 10:56	Dossier de fichiers	
FusTxt	01/07/2022 12:22	Dossier de fichiers	
Images	01/07/2022 12:19	Dossier de fichiers	
Log	01/07/2022 12:19	Dossier de fichiers	
RFID	01/07/2022 12:19	Dossier de fichiers	
camera	01/07/2022 12:33	Document texte	1 Ko
CONFIG_PRIVÉE	07/06/2019 14:14	Paramètres de co...	1 Ko
ConfigDisplay	12/07/2022 13:57	Document texte	2 Ko
DonneesTemp01.dat	01/07/2022 12:47	Fichier DAT	1 Ko
DonneesTemp02.dat	01/07/2022 13:16	Fichier DAT	2 Ko
DonneesTemp03.dat	01/07/2022 12:47	Fichier DAT	1 Ko
DonneesTemp04.dat	01/07/2022 12:47	Fichier DAT	1 Ko
Etiquette.sav	12/07/2022 11:54	Fichier SAV	1 Ko
POLY_affect_io	01/07/2022 12:22	Document texte	3 Ko
POLY_config	01/07/2022 12:21	Paramètres de co...	2 Ko
random	01/07/2022 12:19	Document texte	1 Ko
toREAD	11/07/2022 12:03	Document texte	1 Ko

Analyze

Now let's analyze our data

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ANNEX 1

- Weigh the mice before test. As recorded in the sheet
- Bring one group of animal to the behavior paradigm. Set up the system/computer while mice habituate to the room.
-
- *N.B: Make sure that there*
-

2 training sessions separated 1h

The shock is an aggressive manipulation;

so better make it as easy for an animal as possible

Pay attention to whatever you introduce to that grid; as mice can get distracted as humans; quiet easily; if such a vivid memory creation experience is undergone.

As yesterday you've completed your sixth session of the exercise; all is supposed to be well...

You will enter the grid; there are no remains of food, pee, stool or bedding of another place: {meaning cleaning well; and making sure what is there; resembles what was at house>> yet the context is different}

Mice leave out a lot of traces, better watch out for cleaning

Then;

PROTOCOL:

0- 3 min [180000ms] : H1 {Baseline}

1- 8 secs [8000ms] : HLED(ON) {Light}

1- 2 secs [2000ms] : ASHCK(ON(i0.4)) {Shock: [ON;iON],[if @ON = ON(iX); i=intensity; X="float"]}

2- 1 min [60000ms] : ITL_1 [HLED(!ON),ASHCK(!ON) {ITL_"n"} {CTT=idxn}

\$\$\$\$ __++LSx... TTL Iteration:LSx --> ITL_x-1 \$\$\$\$

3- 1 min [60000ms] : H2 {End}

1,2 Iteration: "args": n[ITL]; n [HLED:ASHCK]

notes@THE DAY@

SHOCK seems to be quiet remarkable for mice, i notice that the indicator LED is not lid; however one can clearly hear an animal squeak following a 2s shock; it seems we're printing bad memories association for the light

Tomorrow is here:

2 Probe tests (one with light and the other with tone) each session 3 min off and then 3 min On, separated at least 1h (both in the morning).

Probe Test 1: Fear: 3 min off and then 3 min On: LED

PROTOCOL:

0- 3 min [180000ms] : T1= H1; T2=_OFF {Baseline}

1- 3 min [180000ms] : T1= HLED(ON); T2=_OFF {Light}

\$\$\$\$ __++LSx... TTL Iteration:LSx --> ITL_x-1 \$\$\$\$

3- 1 min [60000ms] : H2 {End}

1,2 Iteration: "args": n[ITL]; n [HLED:ASHCK]

then;

Probe Test 2: Fear: 3 min off and then 3 min On: LED

PROTOCOL:

0- 3 min [180000ms] : T1= H1; T2=_OFF {Baseline}

1- 3 min [180000ms] : T1= ASND(ON); T2=_ON {Light}

ON(3,3000)

!ON

\$\$\$\$ __++LSx... TTL Iteration:LSx --> ITL_x-1 \$\$\$\$

3- 1 min [60000ms] : H2 {End}

1,2 Iteration: "args": n[ITL]; n [HLED:ASHCK]

- *is no laser coming through the "sleeve". If there is laser leaking, then you need to attach the cable again (i.e., there is a misconnection). You may see laser on top of the skull, that is fine.*

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