

Time generalization, první experiment

Experiments ZS 2023

Jak mohu adaptovat task?

- Co to znamená task v kontextu experimentální psychologie?
- Co musím zachovat?
- Co mohu variovat?
- Mohu něco přidat?

Původní výzkum

Why do temporal generalization gradients change when people make decisions as quickly as possible?

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Sample

24 men and 36 women participated voluntarily and were randomly allocated to four equalized groups (n=15). Mean age of the participants was 37.7 years (SD=10.9).

N=60

Podmínky

- Between factor 1 - **Instrukce:** speeded vs accuracy
- Between factor 2 – **Range:** long vs short

Závisle proměnná

- Weighted mean of gradient (zdánlivé trvání podmínky v milisekundách)
- Proportion of same responses for each duration
- (Latence odpovědi)

Weighted mean of gradient

This was done by multiplying the number of “same” responses with the duration at which a “same” response was given, adding these products, and then dividing this weighted sum by the number of “same” responses of each participant given at all durations

```
#weighted mean gradient

# Assuming you have the 'result_df' dataframe from the previous step
# Calculate the weighted sum for each participant and feedback combination
result_df['Weighted_Sum'] = result_df['b'] * result_df['duration']

# Group by 'participant' and 'feedback' and sum the weighted sums
grouped = result_df.groupby(['participant', 'feedback', 'stress'])['Weighted_Sum'].sum().reset_index()

# Calculate the total count of "b" responses for each participant and feedback combination
grouped['Total_b_Responses'] = result_df.groupby(['participant', 'feedback'])['b'].transform('sum')

# Calculate the weighted mean of the gradient for each participant and feedback combination
grouped['Weighted_Mean_Gradient'] = grouped['Weighted_Sum'] / grouped['Total_b_Responses']

# If you want to save this new dataframe to a CSV file, you can use:
grouped.to_csv("weighted_mean_gradient.csv", index=False)
```


Hypotézy

- Pobídka k rychlosti povede k většímu množství SAME responses u delších stimulů.

KLAPPROTH AND WEARDEN

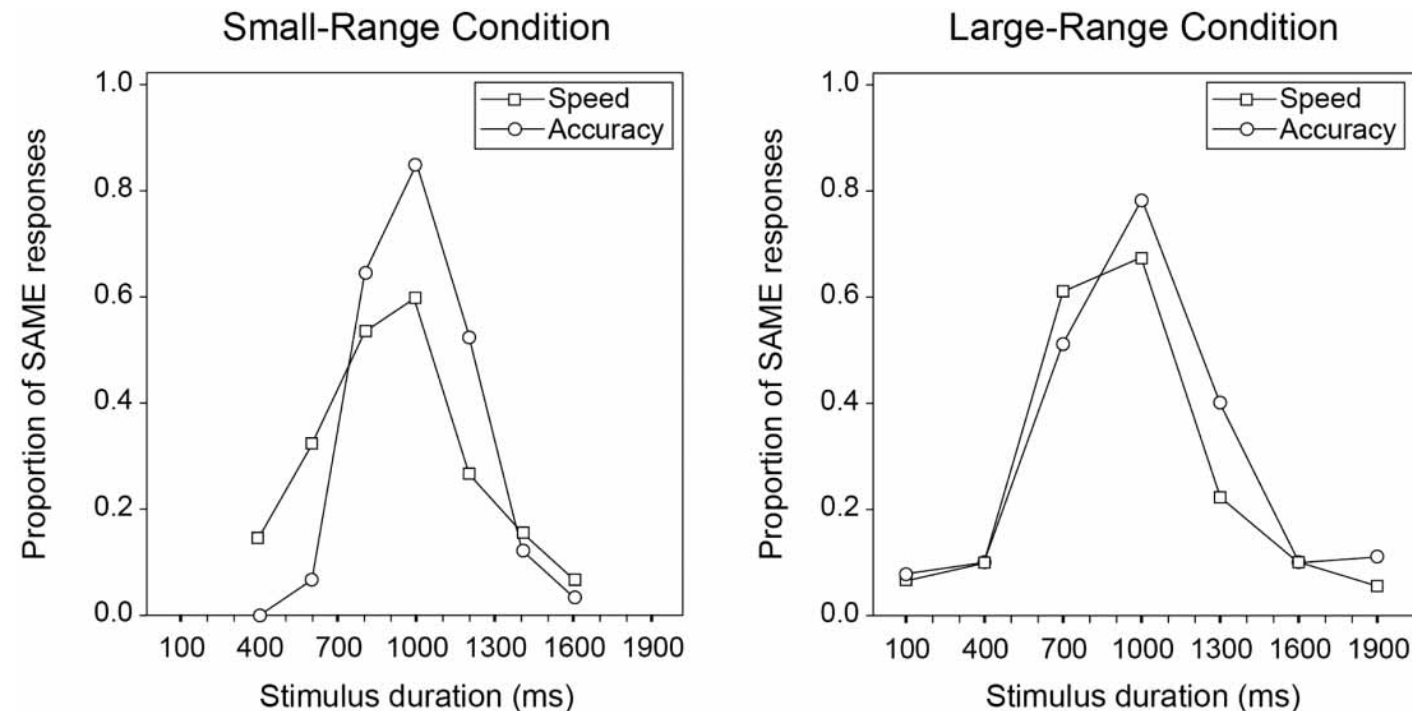


Figure 1. *Temporal-generalization gradients (proportions of “same” responses plotted against stimulus duration) obtained from Experiment 1. Left panel: gradients from the small-range condition; right panel: gradients from the large-range condition. Squares represent data from the speed groups; circles represent data from the accuracy groups.*

Hypotézy

- WMG bude nižší pro Speeded condition.

The average means of the small-range conditions were MSpeed 955.1 ms (SD \hat{L} 57.3) and MAccuracy 1,004.3 ms (SD \hat{L} 21.7), and of the large-range conditions MSpeed 970.0 ms (SD \hat{L} 74.3) and MAccuracy 996.5 ms (SD \hat{L} 66.7).

ANOVA yielded a significant main effect of condition, $F(1, 56) 6.28, p .02$, reflecting the shift of the gradients of the speed groups towards durations shorter than the standard.

Replikace

Orig.

between factor -

Instrukce:

0 accuracy

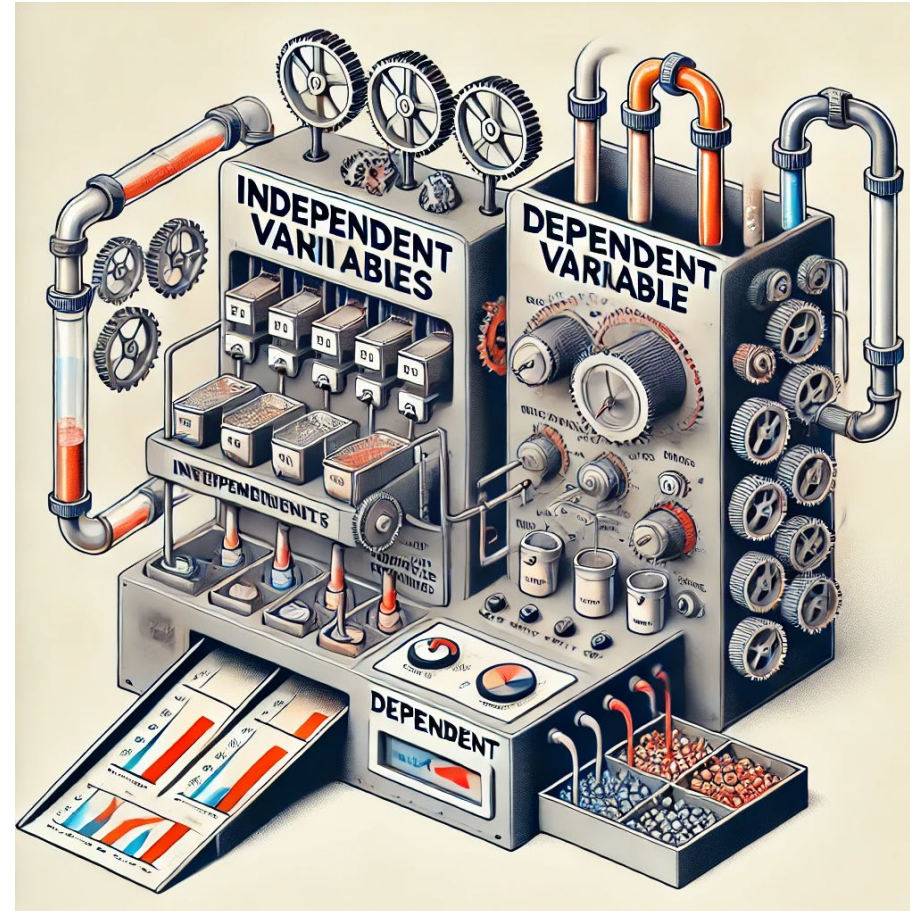
1 speeded

between factor

Range:

0 short

1 long



- Weighted mean of gradient
- Proportion of same responses for each duration
- Latency

Rep.

between factor -

Instrukce:

0 accuracy

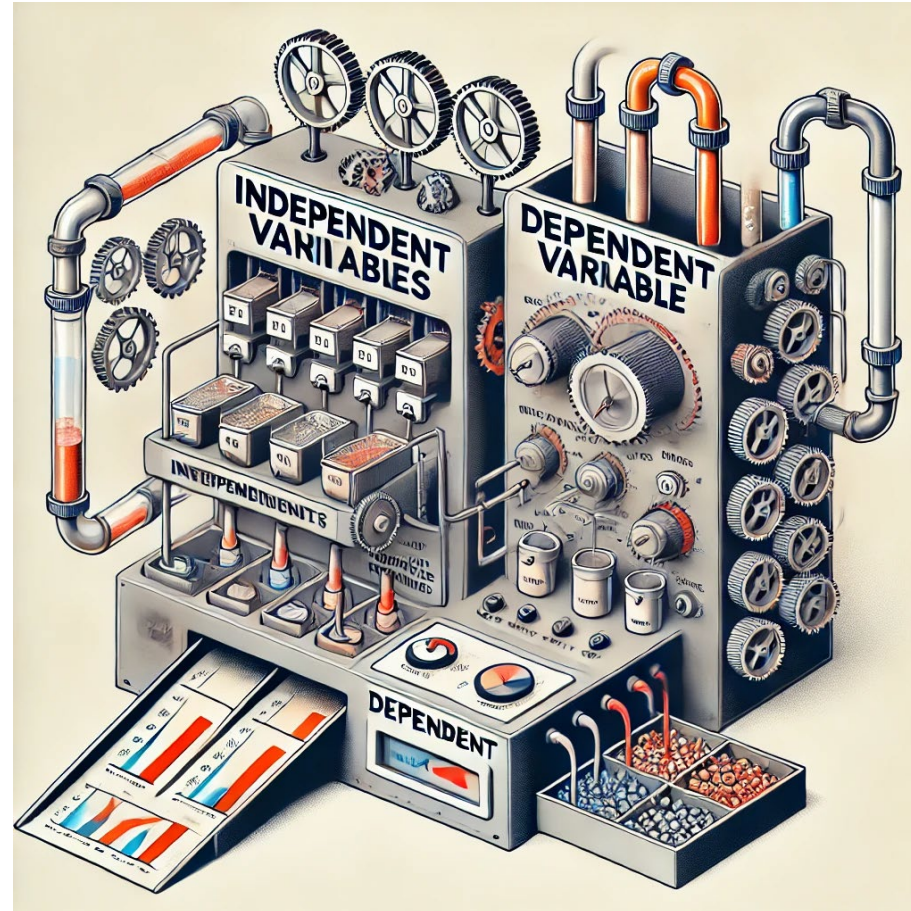
1 speeded

within factor

Feedback:

0 non-present

1 present



- a. Weighted mean of gradient
- b. Proportion of same responses for each duration
- c. Latency

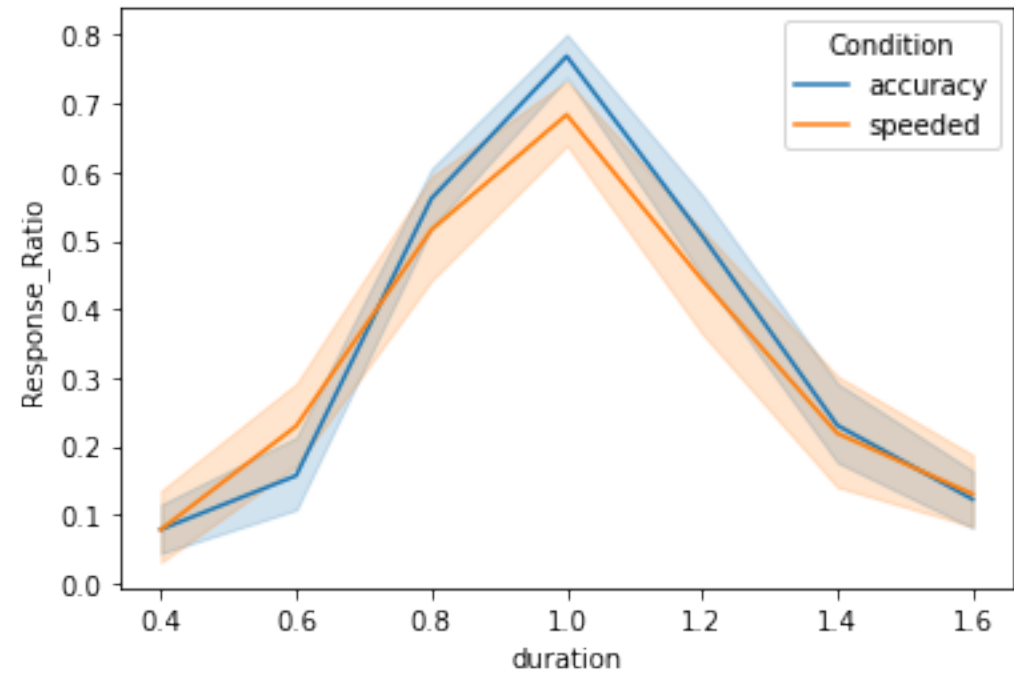
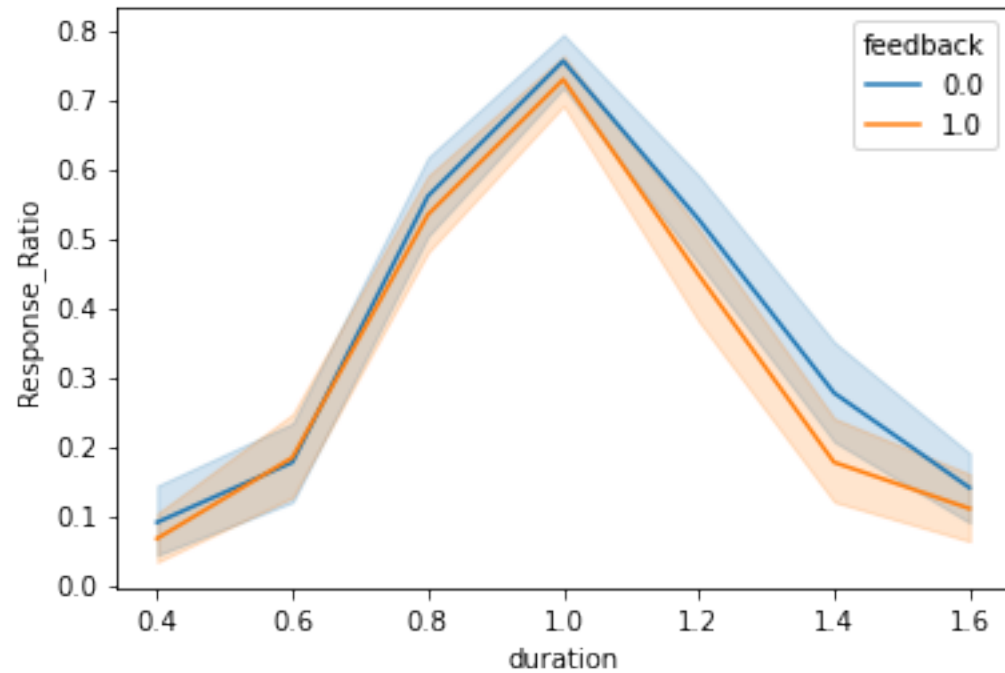
Hypotézy

- Přítomnost feedbacku zpřesní odhad trvání stimulů.
- Speeded condition povede k vnímání časového úseku jako delšího
- Replikační hypotéza by byla o interakci (speeded condition + feedback => longer subjective time)

Experiment

- 6 bloků po 10 trialech pro každou within podmínku (feedback yes/no)
- Přechází jim zácvik (10 trialů)

Response ratios



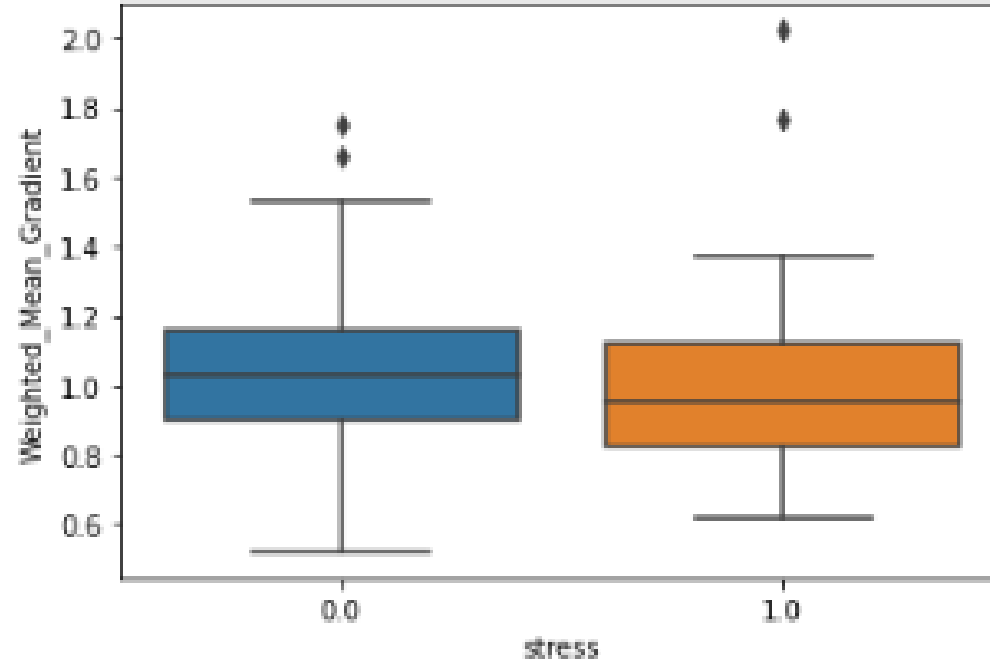
Speeded vs accuracy

	T	dof	tail	p-val	CI95%	cohen-d	BF10	power
T-test	0.39449	48.876565	two-sided	0.694938	[-0.1, 0.14]	0.092903	0.24	0.071351

WMG under accuracy condition: 1.0404365561914144

WMG under speeded condition: 1.016847703205995

mean difference: 0.02358885298541935



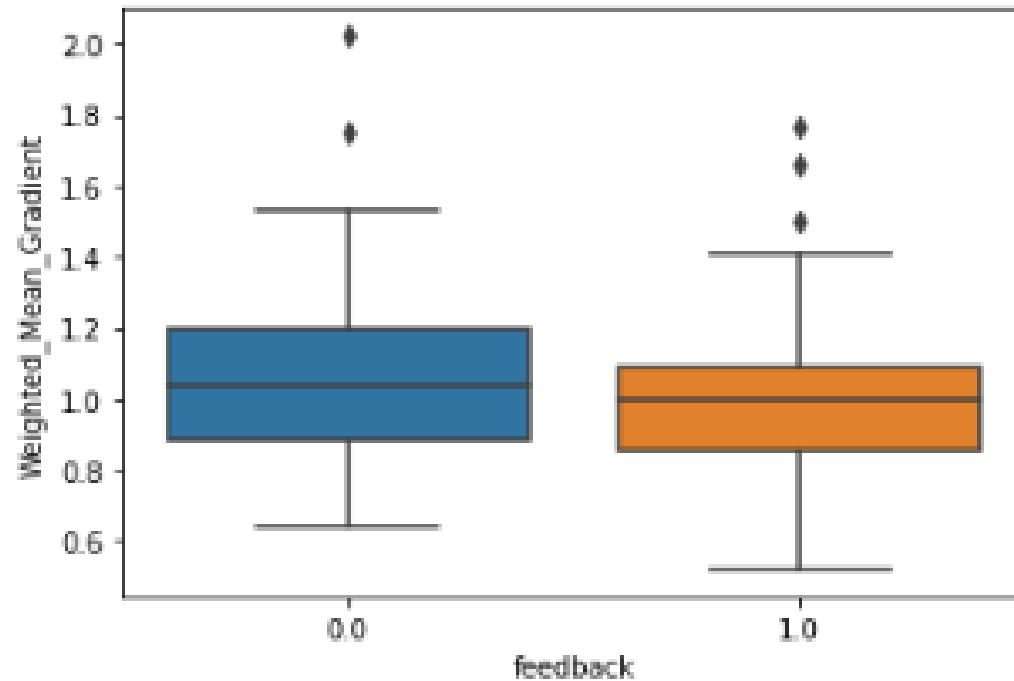
Feedback vs no feedback

	T	dof	tail	p-val	CI95%	cohen-d	BF10	power
T-test	1.594912	98	two-sided	0.113952	[-0.02, 0.18]	0.318982	0.649	0.351822

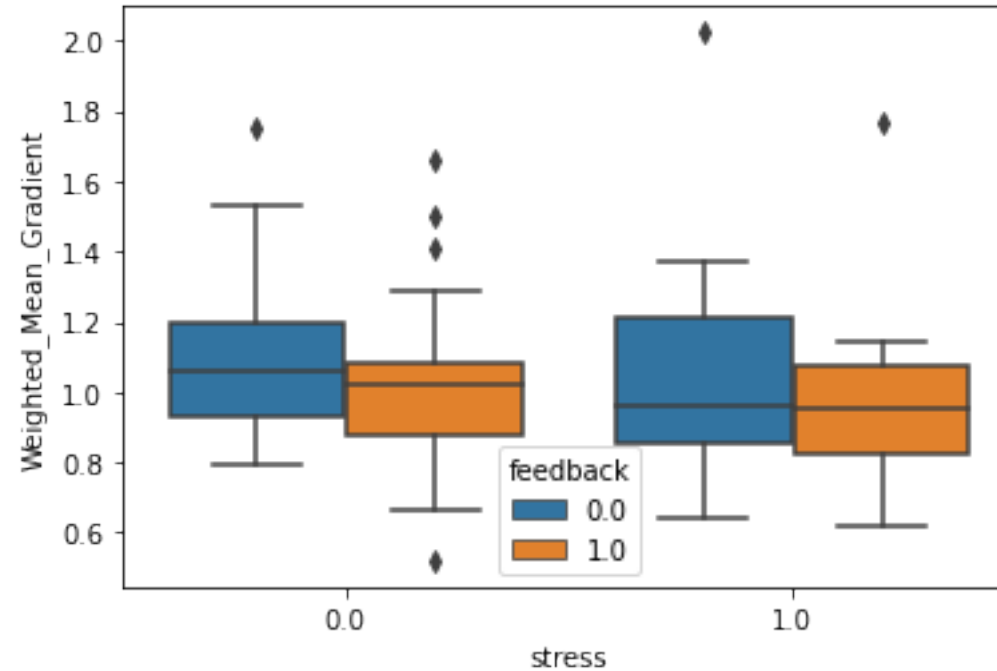
WMG under no-feedback condition: 1.0729071721420456

WMG under feedback condition: 0.9928690743301155

mean difference: 0.08003809781193005



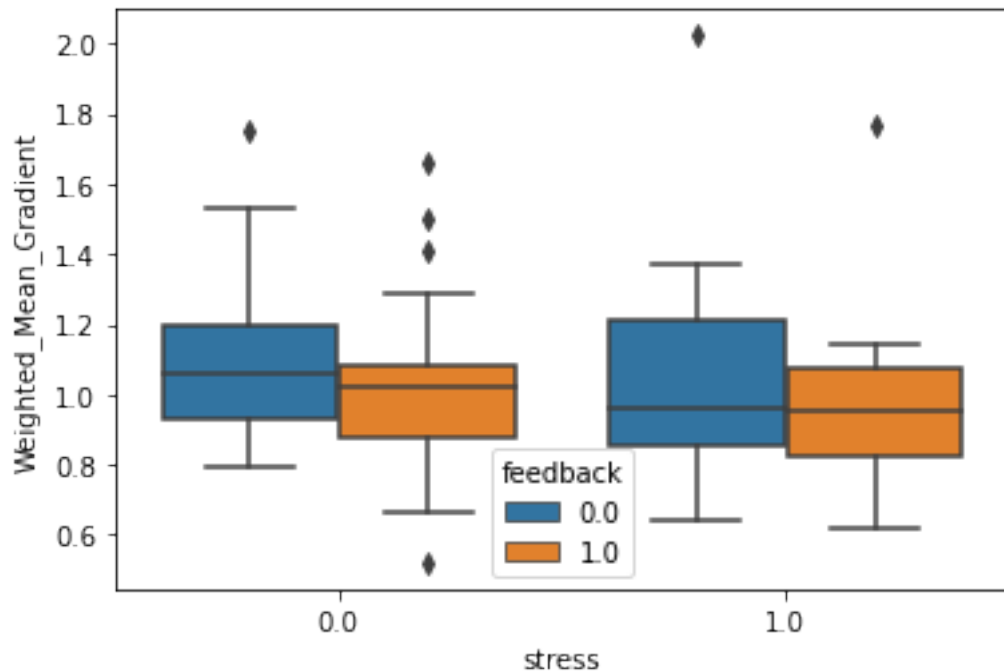
Interaction



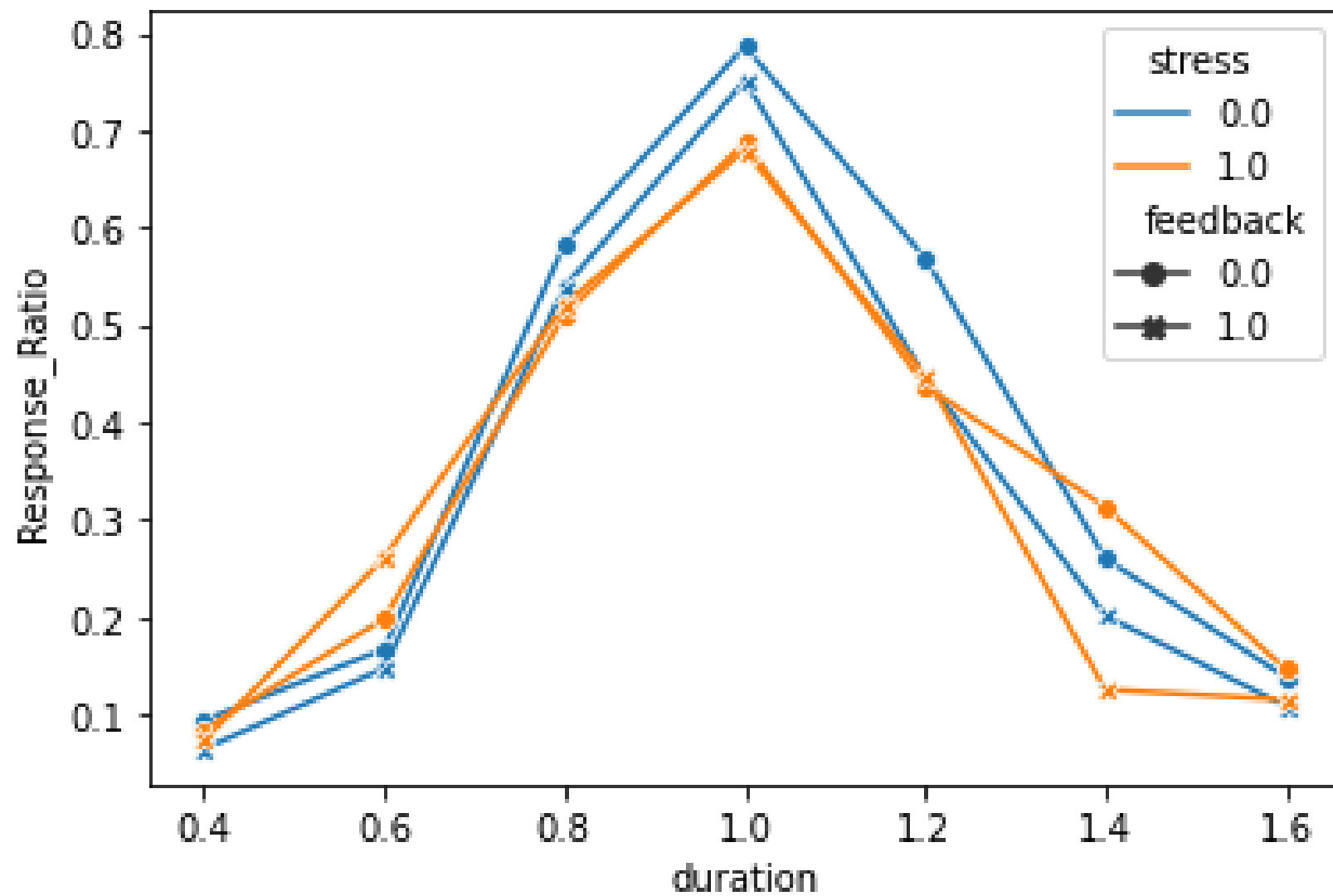
	Source	SS	DF1	DF2	MS	F	p-unc	np2	eps
0	stress	0.012108	1	48	0.012108	0.146088	0.703991	0.003034	NaN
1	feedback	0.160152	1	48	0.160152	3.527120	0.068455	0.068452	1.0
2	Interaction	0.000060	1	48	0.000060	0.001324	0.971126	0.000028	NaN

Interaction

	speeded	accuracy
feedback	0.975	1
no feedback	1.0579	1.079



Interaction



Design experimentu - time generalization task

Experimentální psychologie, ZS 23

Training block

- 10 trials with feedback
- Jaký stimul použít?
 - Neutrální
 - Jednu z podmínek
 - Vyvážený průřez podmínkami
- Nezahrnujeme do analýzy

Counterbalancing

- Dva způsoby:
 - Pořadí bloků randomizováno
 - Podmínky prezentovány se stejnou pravděpodobností v každém z bloků

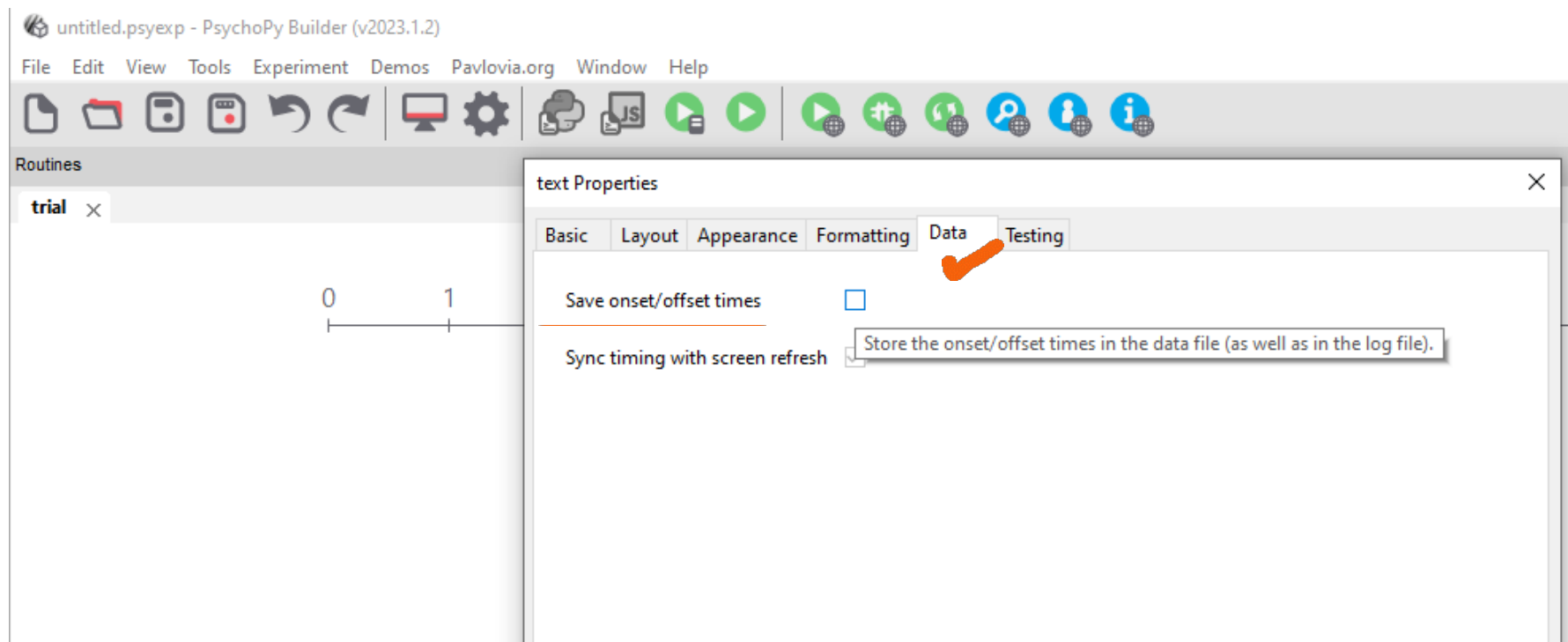
Stimuly

- Moje hypotéza se netýká podoby stimulu
 - Stimul je konstantní
- Moje hypotéza se týká podoby stimulu
 - A) Mám dvě až čtyři podmínky, které se liší podobou stimulu
 - B) Mám dvě až čtyři podmínky, a pro každou z nich sadu stimulů, které odpovídají dané podmínce

- Každou podmínku prezentujeme 60x
 - 6x 0.4s, 0.6s, 0.8s, 1.2s, 1.4s, 1.6s
 - 24x 1s

Data

- PsychoPy defaultně registruje vše
- Můžeme sbírat vše a vyhodit nepotřebné údaje až při tvorbě data frame pro analýzu OR můžeme jednoznačně nepotřebné údaje vůbec neukládat



Co za data registrovat

- Odpovědi (b, n)
- Korektnost odpovědi (1, 0)
- Trvání prezentace stimulu – duration
- Číslo bloku
- Číslo trialu
- Reakční čas v trialu
- Časy prezentace stimulu
- Čas pauzy mezi bloky
- ...

Co za data nepotřebujeme

- Čas zobrazení instrukcí
- Reakční čas na pobídku k zmáčknutí spacebar
- ...