SOMA Report


Kevin
Trends
1 week
1 month
4 months
all
Pain intensity
Pain Unpleasantness
Mood
Trends
Where are you experiencing pain right now?
front
back
Save
I can not locate my pain.

SOMA Report Details

Generated by: Chad C. Williams

Date: 2025-04-11

Inputted Parameters

Help: False

Author: Chad C. Williams

Dataset: Both pain datasets

Rscripts Path: C:/Program Files/R/R-4.4.1/bin/x64/Rscript

File Path: D:\BM_Carney_Petzschner_Lab\SOMAStudyTracking\SOMAV1\database_exports\avoid_learn_prolific

File Name: ['v1a_avoid_pain\v1a_avoid_pain.csv', 'v1b_avoid_paindepression\v1b_avoid_paindepression.csv']

Split By Group: pain

Split By Group Id: pain

Covariate: None

Depression Cutoff: 10

Rolling Mean: 5

Accuracy Exclusion Threshold: 55

Rt Low Threshold: 200

Rt High Threshold: 5000

Tests: basic

Test Rolling Mean: 5

Test Context Type: context

Hide Stats: False

Hide Posthocs: True

Load Stats: True

Load Models: False

Verbose: True

Data Characteristics

Files: v1a_avoid_pain\v1a_avoid_pain.csv, v1b_avoid_paindepression \v1b_avoid_paindepression.csv

Grouping

Split by Group: Pain

Column Names

participant_id, trial_type, trial_index, rt, symbol_L_name, symbol_R_name, feedback_L, feedback_R, context_val, choice_made, context_val_name, duration, group_code, intensity, unpleasant, interference, age, sex, symbol_L_value, symbol_R_value, neutral_values, composite_pain

Data Dimensions

Rows: 120912

Columns: 22

Number of Groups: 3

Number of Original Participants: 360

Number of Participants Excluded (Pain Threshold): 74

Number of Participants Excluded (Accuracy Threshold: 55%): 49

Number of Participants Remaining: 237

Percentage of Trials Excluded (RT Threshold: $<$ 200ms or $>$ 5000ms): 1.27%

Table 1. Demographic information for each group. Group differences reflect which groups are significantly different from the no pain group in planned follow-up tests.

	No Pain	Acute Pain	Chronic Pain	P-Value
Demographics				
Sample Size	108	52	77	
Age	34.02 (11.68)	36.52 (13.52)	41.34 (13.39)	0.0007
Gender (F/M/N)	56 / 52 / 0	29 / 22 / 1	53 / 23 / 1	
Pain Scores				
Intensity	4.96 (5.56)	42.78 (19.23)	48.86 (17.94)	<0.0001
Unpleasant	4.08 (4.69)	47.04 (18.41)	51.8 (18.4)	<0.0001
Interference	3.73 (5.48)	46.74 (19.48)	50.33 (20.76)	<0.0001

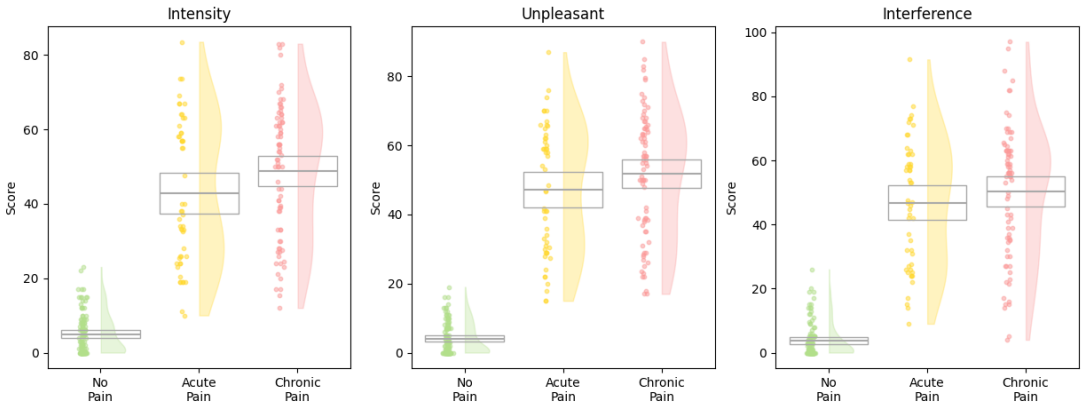

Figure 1. Pain metrics for each group. Boxplots show the mean and 95% confidence intervals of the corresponding metric for each group. Half-violin plots show the distribution of the scores of the corresponding metric for each group. Scatter points show the scores of the corresponding metric for each participant within each group.

Demographics And Clinical Scores Statistics

Age, pain intensity, pain unpleasantness, pain interference were modelled using linear regression with the following formula: *metric~group_code*.

Age*: $F(2, 234) = 7.54, p < 0.001$

Pain Intensity*: $F(2, 234) = 253.52, p < 0.001$

Pain Unpleasantness*: $F(2, 234) = 318.0, p < 0.001$

Pain Interference*: $F(2, 234) = 252.98, p < 0.001$

Results

Learning Accuracy

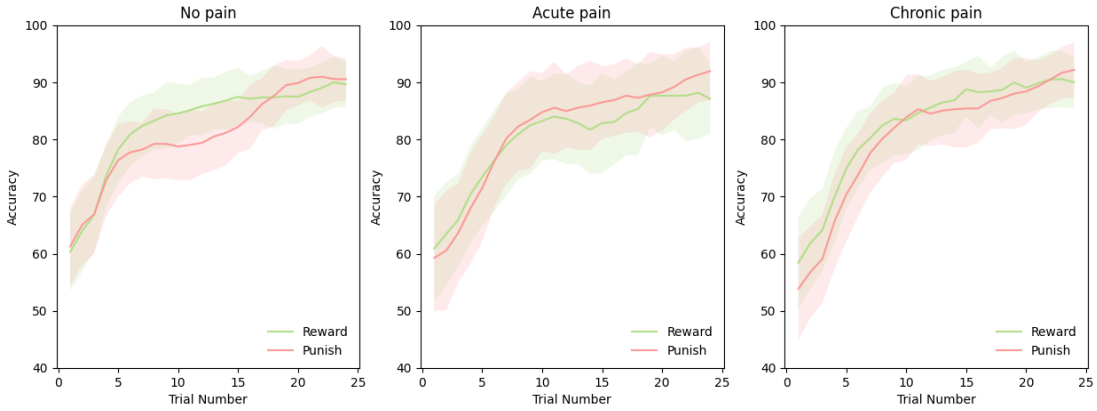

Figure 2. Behavioral performance across learning trials for the reward and punishment contexts for each group. For visualization, the accuracy is smoothed using a rolling mean of 5 trials. Shaded regions represent 95% confidence intervals.

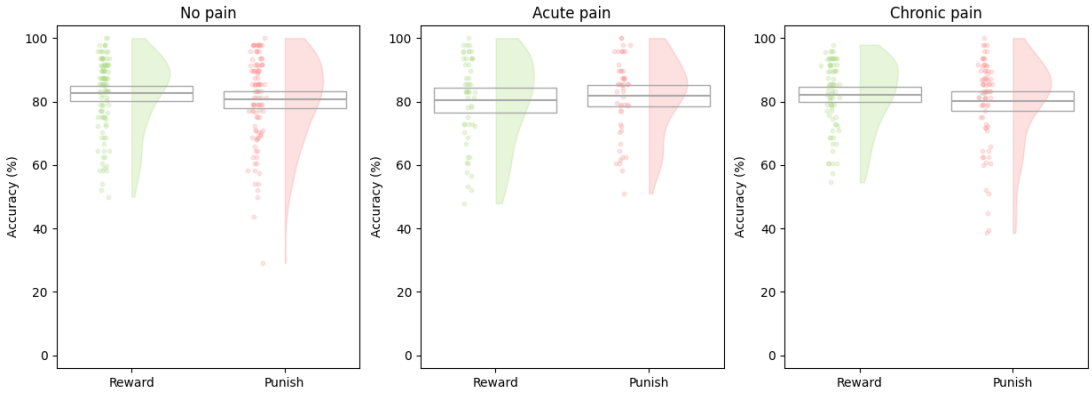

Figure 3. Averaged behavioral performance during learning for the reward and punishment contexts for each group. Boxplots show the mean and 95% confidence intervals of the accuracy for each context across participants within each group. Half-violin plots show the distribution of accuracy for each context across participants within each group. Scatter points show the averaged accuracy for each participant within each context.

Learning Accuracy Statistics

Accuracy in the learning phase was modelled using a linear mixed effects model with the following formula: $accuracy \sim 1 + group:context:binned\_trial + (1|participant\_id)$, where *group, context, binned_trial, group:context:binned_trial* are the fixed effects and *participant_id* is the random effect. Following each main and interaction finding from the linear model, we report planned comparison t-tests, corrected using a Welch's t-test when the assumption of homogeneity of variance was violated.

Group: $\chi^2(2, N = 237) = 0.17, p = 0.918$

Chronic Pain Vs No Pain

$t(183) = -0.25, p = 0.8042, d = -0.04.$

Chronic Pain Vs Acute Pain

$t(127) = 0.05, p = 0.958, d = 0.01.$

Context: $\chi^2(1, N = 237) = 1.56, p = 0.211$

Binned_Trial*: $\chi^2(3, N = 237) = 1001.12, p < 0.001$

Group:Context*: $\chi^2(2, N = 237) = 6.56, p = 0.038$

Chronic Pain Vs No Pain: Reward

$t(183) = -0.21, p = 0.8356, d = -0.03.$

Chronic Pain Vs No Pain: Loss Avoid

$t(183) = -0.21, p = 0.8324, d = -0.03.$

Chronic Pain Vs No Pain: Reward-Loss Avoid

$t_{Welch}(180) = 0.03, p = 0.9732, d = 0.0.$

Group:Binned_Trial*: $\chi^2(6, N = 237) = 12.74, p = 0.047$

Context:Binned_Trial: $\chi^2(3, N = 237) = 4.58, p = 0.205$

Group:Context:Binned_Trial*: $\chi^2(6, N = 237) = 13.19, p = 0.04$

Learning Reaction Time

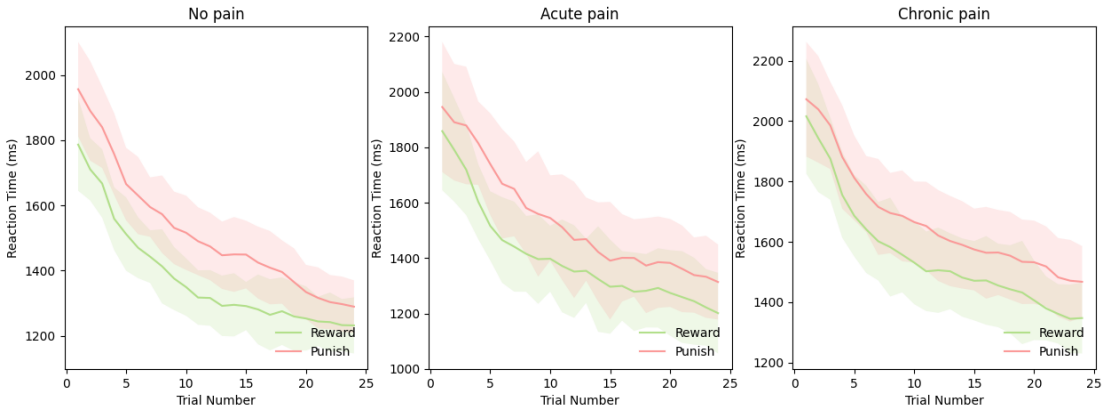

Figure 4. Reaction times across learning trials for the reward and punishment contexts for each group. For visualization, the reaction time is smoothed using a rolling mean of 5 trials. Shaded regions represent 95% confidence intervals.

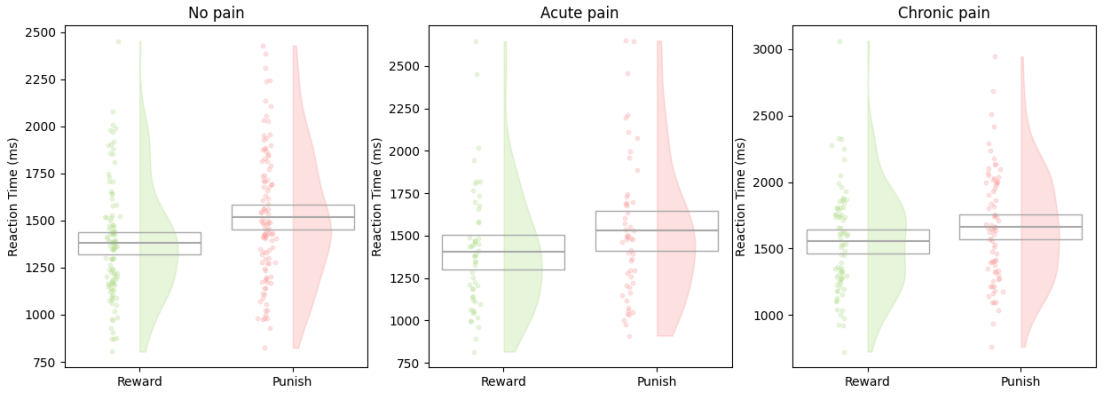

Figure 5. Averaged behavioral performance during learning for the reward and punishment contexts for each group. Boxplots show the mean and 95% confidence intervals of the reaction times for each context across participants within each group. Half-violin plots show the distribution of reaction times for each context across participants within each group. Scatter points show the averaged reaction times for each participant within each context.

Learning Rt Statistics

Rt in the learning phase was modelled using a linear mixed effects model with the following formula: $rt \sim 1 + group:context:binned\_trial + (1|participant\_id)$, where *group, context, binned_trial, group:context:binned_trial* are the fixed effects and *participant_id* is the random effect. Following each main and interaction finding from the linear model, we report planned comparison t-tests, corrected using a Welch's t-test when the assumption of homogeneity of variance was violated.

Group*: $\chi^2(2, N=237) = 6.4, p = 0.041$

Chronic Pain Vs No Pain

$t(183) = -2.88, p = 0.0044^*, d = -0.43.$

Chronic Pain Vs Acute Pain

$t(127) = -2.24, p = 0.0267^*, d = -0.4.$

Context*: $\chi^2(1, N=237) = 241.86, p < 0.001$

Binned_Trial*: $\chi^2(3, N=237) = 1763.24, p < 0.001$

Group:Context: $\chi^2(2, N=237) = 5.97, p = 0.05$

Chronic Pain Vs No Pain: Reward

$t_{Welch}(136) = 3.28, p = 0.0013^*, d = 0.51.$

Chronic Pain Vs No Pain: Loss Avoid

$t(183) = 2.6, p = 0.0102^*, d = 0.39.$

Chronic Pain Vs No Pain: Reward-Loss Avoid

$t(183) = 0.85, p = 0.3981, d = 0.13.$

Group:Binned_Trial*: $\chi^2(6, N=237) = 25.71, p < 0.001$

Context:Binned_Trial: $\chi^2(3, N=237) = 4.88, p = 0.181$

Group:Context:Binned_Trial: $\chi^2(6, N=237) = 8.79, p = 0.186$

Choice Rate

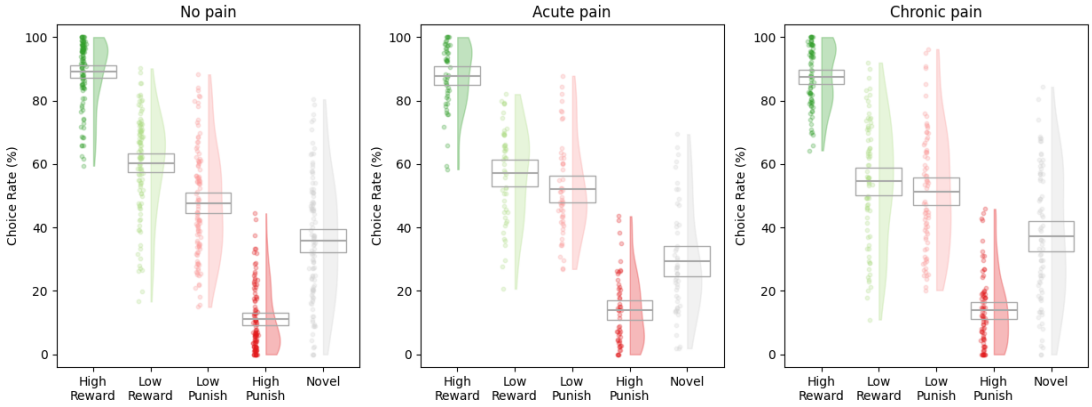

Figure 6. Choice rate for each symbol during transfer trials for each group. Choice rate is computed as the percentage of times a symbol was chosen given the number of times it was presented. Boxplots show the mean and 95% confidence intervals of the choice rate for each symbol type across participants within each group. Half-violin plots show the distribution of choice rates for each symbol type across participants within each group. Scatter points show the averaged choice rate for each participant within each symbol type.

Transfer Choice Rate Statistics

Choice_rate in the transfer phase was modelled using a linear mixed effects model with the following formula: *choice_rate∼1+group:symbol+(1|participant_id)*, where *group, symbol, group:symbol* are the fixed effects and *participant_id* is the random effect. Following each main and interaction finding from the linear model, we report planned comparison t-tests, corrected using a Welch's t-test when the assumption of homogeneity of variance was violated.

Group: $\chi^2(2, N=237) = 1.59, p = 0.452$

Chronic Pain Vs No Pain

$t(183) = -2.78, p = 0.006^*, d = -0.41.$

Chronic Pain Vs Acute Pain

$t(127) = -1.67, p = 0.0969, d = -0.3.$

Symbol*: $\chi^2(4, N=237) = 664.15, p < 0.001$

High Reward Vs Low Punish

$t(236) = 26.3, p < 0.0001^*, d = 1.71.$

Low Reward Vs Low Punish

$t(236) = 3.9, p = 0.0001^*, d = 0.25.$

Group:Symbol*: $\chi^2(8, N=237) = 22.96, p = 0.003$

No Pain Vs Acute Pain: High Reward-Low Punish

$t(158) = -1.52, p = 0.1302, d = -0.26.$

No Pain Vs Chronic Pain: High Reward-Low Punish

$t(183) = -1.55, p = 0.1221, d = -0.23.$

Acute Pain Vs Chronic Pain: High Reward-Low Punish

$t(127) = 0.11, p = 0.916, d = 0.02.$

No Pain Vs Acute Pain: Low Reward-Low Punish

$t(158) = 1.51, p = 0.1325, d = 0.26.$

No Pain Vs Chronic Pain: Low Reward-Low Punish

$t(183) = 2.0, p = 0.0475^*, d = 0.3.$

Acute Pain Vs Chronic Pain: Low Reward-Low Punish

$t(127) = 0.34, p = 0.7316, d = 0.06.$

Transfer Reaction Time

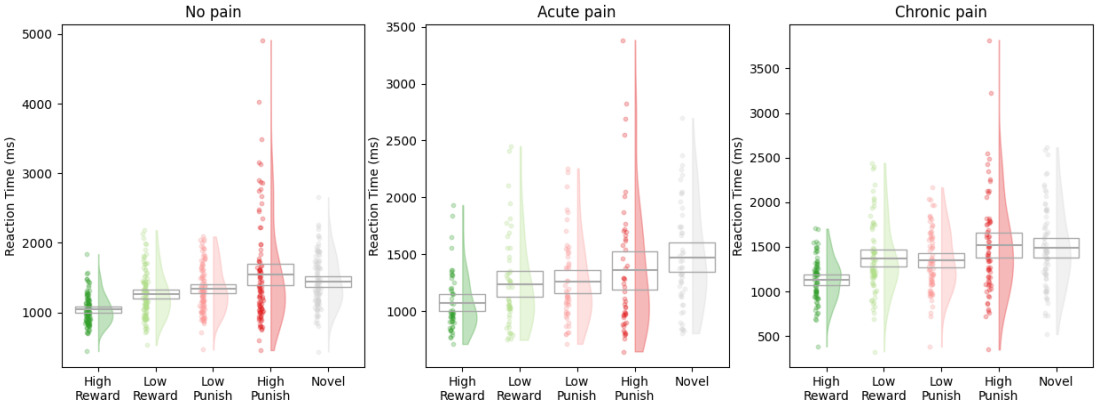

Figure 7. Reaction times for each symbol during transfer trials for each group. Boxplots show the mean and 95% confidence intervals of the reaction times for each symbol type across participants within each group. Half-violin plots show the distribution of reaction times for each symbol type across participants within each group. Scatter points show the averaged reaction time for each participant within each symbol type.

Transfer Rt Statistics

Choice_rt in the transfer phase was modelled using a linear mixed effects model with the following formula: $choice\_rt \sim 1 + group:symbol + (1|participant\_id)$, where *group, symbol, group:symbol* are the fixed effects and *participant_id* is the random effect. Following each main and interaction finding from the linear model, we report planned comparison t-tests, corrected using a Welch's t-test when the assumption of homogeneity of variance was violated.

Group: $\chi^2(2, N=237) = 1.93, p = 0.381$

Chronic Pain Vs No Pain

$t(183) = -1.08, p = 0.2829, d = -0.16.$

Chronic Pain Vs Acute Pain

$t(127) = -1.33, p = 0.1858, d = -0.24.$

Symbol*: $\chi^2(4, N=237) = 427.34, p < 0.001$

High Reward Vs Low Punish

$t(236) = -16.2, p < 0.0001^*, d = -1.05.$

Low Reward Vs Low Punish

$t(236) = -1.83, p = 0.0684, d = -0.12.$

Group:Symbol*: $\chi^2(8, N=237) = 33.52, p < 0.001$

No Pain Vs Acute Pain: High Reward-Low Punish

$t(158) = 2.93, p = 0.0038^*, d = 0.5.$

No Pain Vs Chronic Pain: High Reward-Low Punish

$t(183) = 2.34, p = 0.0202^*, d = 0.35.$

Acute Pain Vs Chronic Pain: High Reward-Low Punish

$t(127) = -0.7, p = 0.4826, d = -0.13.$

No Pain Vs Acute Pain: Low Reward-Low Punish

$t(158) = -1.41, p = 0.1603, d = -0.24.$

No Pain Vs Chronic Pain: Low Reward-Low Punish

$t(183) = -2.64, p = 0.0091^*, d = -0.39.$

Acute Pain Vs Chronic Pain: Low Reward-Low Punish

$t(127) = -1.01, p = 0.3167, d = -0.18.$