

OBIWAN BEHAVIORAL ANALYSIS

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Setup

May I suggest running `repro::automate()`? This will create a `Dockerfile` & `Makefile` based on every RMarkdown in this folder and the special yamls in them. add ENV `DEBIAN_FRONTEND=noninteractive` If you are unsure weather or not you have `git make` & `docker`.

```
## v Git is installed, don't worry.
```

```
## v Make is installed, don't worry.
```

```
## v Docker is installed, don't worry.
```

Demographics

Summary statistics:

Table 1: AGE

group	mean	sd	min	max
Lean	-0.18	1.02	-1.50	2.36
Obese	0.07	1.00	-1.58	2.12

Table 2: BMI

group	mean	sd	min	max
Lean	22.37	1.83	18.6	24.8
Obese	35.49	3.21	30.5	44.1

Table 3: GENDER

gender	group	n
Men	Lean	12
Men	Obese	19
Women	Lean	14
Women	Obese	42

Table 4: Group

group	n
Lean	26
Obese	61

Pavlovian Conditioning Task

Analysis: Reaction Times

Model Selection we followed Barr et al. (2013) approach to construct random structure and covariates SEE -> R/MS_PAV_T0.R

Formula = RT_T ~ condition*group + (condition|id) + (1|trialxcondition)

//The parametric bootstrap involves sampling from the estimated model whose parameters are replaced by its unbiased estimators taken from the sample. For unequal cell frequencies

Table 5: Reaction Times (log)

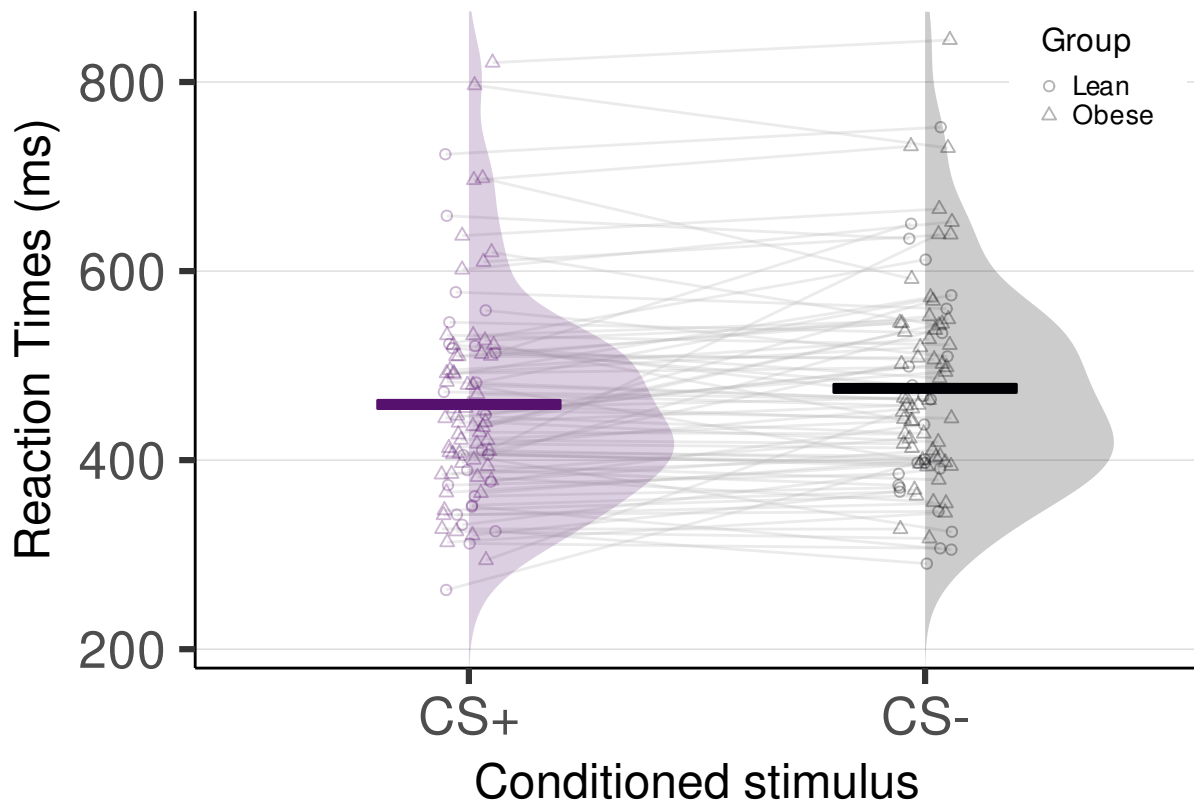
Predictors	Estimates	std. Error
condition [1]	-0.015	0.007
group [1]	-0.031	0.025
condition [1] * group [1]	0.004	0.007

ICC	0.45
N id	87
N trialxcondition	20
Observations	3244
Marginal R2 / Conditional R2	0.010 / 0.456

Table 6: Parametric Bootstrap Test method to evaluate significance of fixed effects in mixed-effects models (using MLE fit, nsim = 500) and Bayes Factor from mixed models (see Wagenmakers, 2007)

Effect	df	Chisq	p.value	BF
condition	1	4.88 *	.027	5.11
group	1	1.52	.218	0.36
condition:group	1	0.35	.552	0.44

Reaction Times by condition



Analysis: Pleasantness Ratings (Pavlovian Cue)

Using ANOVA here because no hierarchical structure

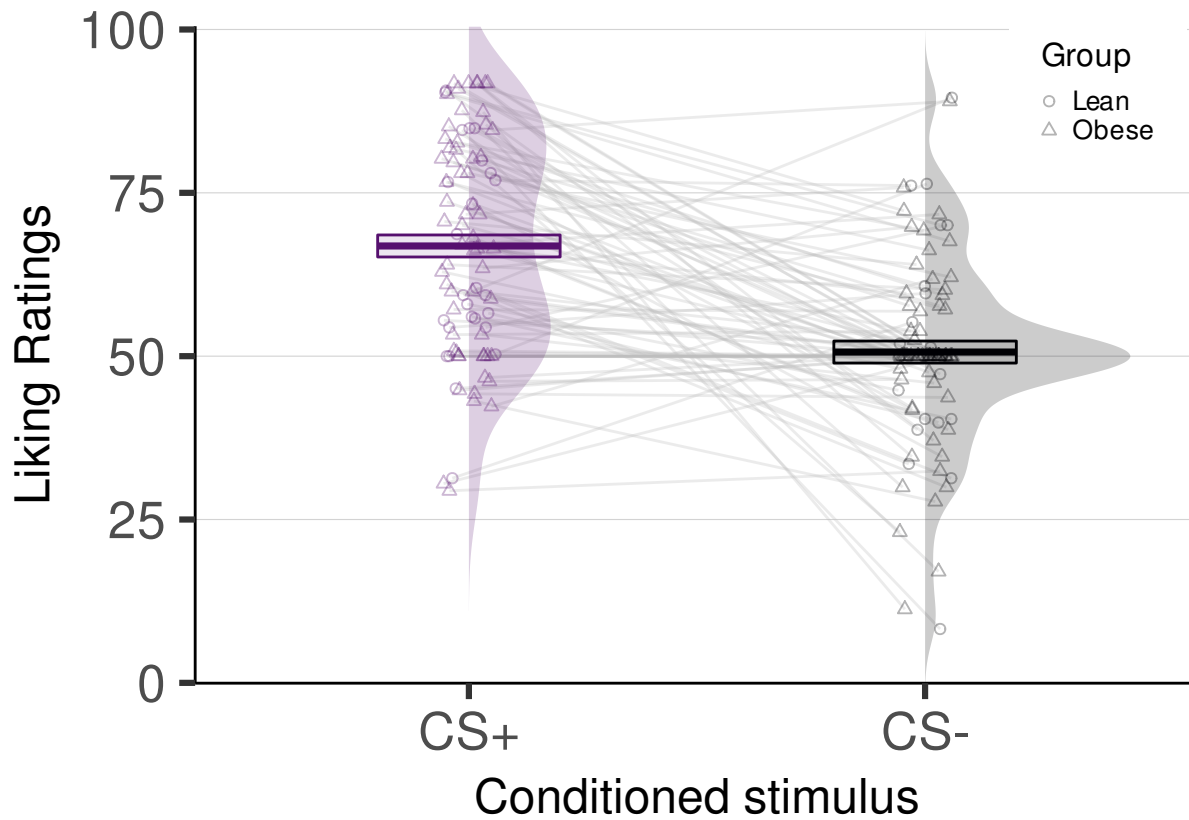
Formula = liking ~ condition*group + Error (id/condition)

Bayes factor

Table 7: Pleasantness Rating

	Effect	df	MSE	F	pes	p.value	BF
2	condition	1, 85	248.30	35.01 ***	.292	<.001	2.05e-01
1	group	1, 85	242.63	0.13	.002	.716	1.04e+299
3	group:condition	1, 85	248.30	0.57	.007	.452	2.49e+301

Pleasantness Ratings by condition (Pavlovian Cue)



Instrumental Conditioning Task

Analysis: Number of Grips

Model selection we followed Barr et al. (2013) approach to construct random structure and covariates SEE -> R/MS_INST.R

Formula = grips ~ trial*group + thirsty + hungry + (1 | id)

Model Comparison between linear, quadratic, cubic and spline(5)

Table 8: Model Fit Comparison

Model	BF
trial * group + thirsty + hungry + piss + (1 id)	1.0
trial + I(trial ²) * group + thirsty + hungry + piss + (1 id)	45.8
trial + I(trial ²) + I(trial ³) * group + thirsty + hungry + piss + (1 id)	103.3
lspline(trial, 5) * group + thirsty + hungry + piss + (1 id)	771.7

Piecewise Regression with Splines has the best fit

Table 9: Number of grips

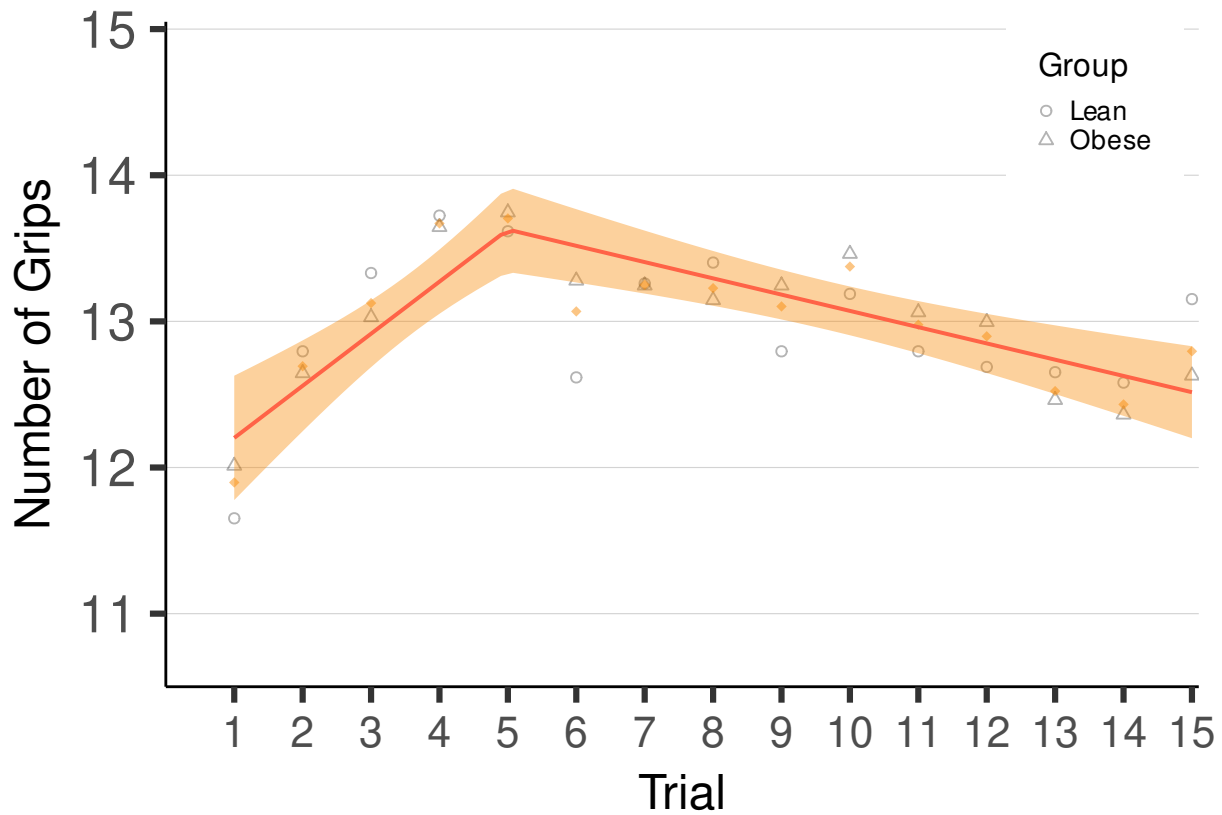
Predictors	Estimates	std. Error
trial < 5	0.351	0.084
trial > 5	-0.114	0.014
group[1]	-0.680	0.804
trial < 5 * group[1]	-0.025	0.084
trial > 5 * group[1]	0.010	0.014

ICC	0.79
N id	88
Observations	2112
Marginal R2 / Conditional R2	0.017 / 0.795

Table 10: Parametric Bootstrap Test method to evaluate significance of fixed effects in mixed-effects models (using MLE fit, nsim = 500) and Bayes Factor from mixed models (see Wagenmakers, 2007)

Effect	df	Chisq	p.value	BF
trial < 5	1	17.24 ***	<.001	7.44e+02
trial > 5	1	66.82 ***	<.001	1.19e+16
group	1	0.71	.398	3.52e-02
trial < 5 * group	1	0.09	.769	2.27e-02
trial > 5 * group	1	0.53	.467	2.83e-02

Number of Grips over time



Pavlovian-Instrumental Transfer (PIT) Task

Analysis: Mobilized effort (AUC)

Model selection we followed Barr et al. (2013) approach to construct random structure and covariates SEE -> R/MS_PIT.R

Formula = $AUC \sim \text{condition} * \text{group} + \text{hungry} + \text{hungry} : \text{condition} + (\text{condition} | \text{id}) + (1 | \text{trial} \times \text{condition})$

Table 11: Mobilized effort (AUC)

Predictors	Estimates	std. Error
condition [1]	2.151	2.136
group [1]	-7.916	9.530
hungry	-10.466	9.005
condition [1] * group [1]	-4.871	2.152
condition [1] * hungry	3.826	2.034

ICC	0.74
N id	86
N trialxcondition	15
Observations	2580
Marginal R2 / Conditional R2	0.022 / 0.750

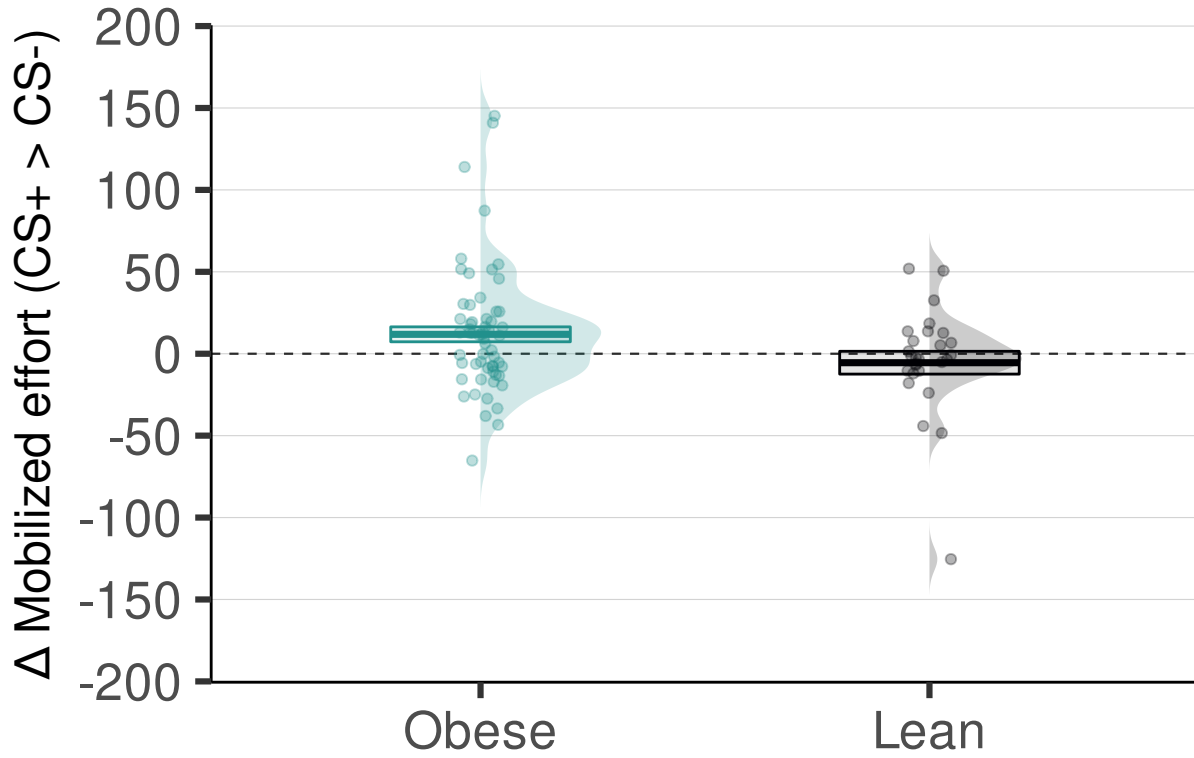
Table 12: Parametric Bootstrap Test method to evaluate significance of fixed effects in mixed-effects models (using MLE fit, nsim = 500) and Bayes Factor from mixed models (see Wagenmakers, 2007)

Effect	df	Chisq	p.value	BF
condition	1	1.04	.307	2.49
group	1	0.71	.400	0.63
hungry	1	1.38	.240	0.58
condition:group	1	5.15 *	.023	4.83
condition:hungry	1	3.59 +	.058	2.22

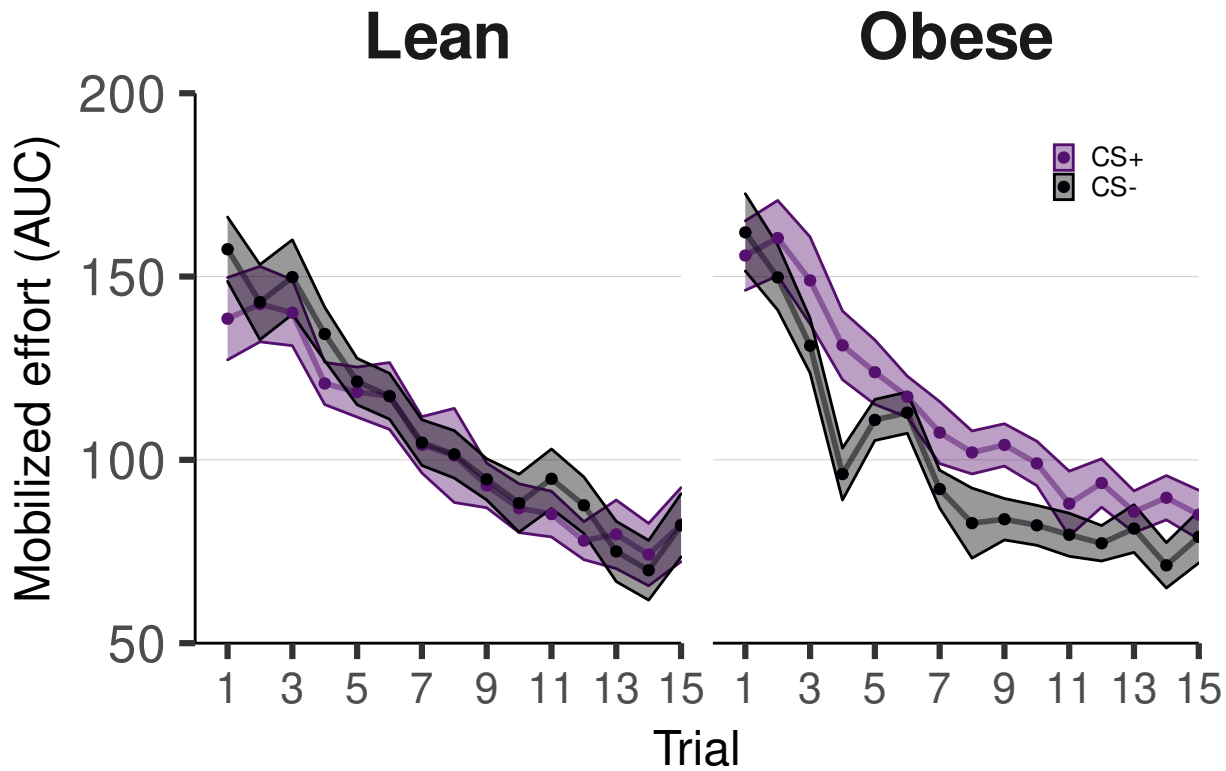
Table 13: Post-Hoc test (pairwise condition|group, adjust = tukey)

contrast	group	estimate	SE	lower.CL	upper.CL	t	p
CS+ > CS-	Lean	-5.477	6.957	-19.323	8.368	-0.787	0.783
CS+ > CS-	Obese	11.844	4.551	2.788	20.900	2.603	0.006

Mobilized effort (AUC) difference (CS+ > CS-) by group



Mobilized effort (AUC) over time



Hedonic Reactivity Task

Analysis: Pleasantness Ratings (Taste)

Model selection we followed Barr et al. (2013) approach to construct random structure and covariates SEE -> R/MS_HED.R

Formula = Pleasantness ~ condition*group + hungry + hungry:condition + familiarity + intensity + intensity:condition + (condition |id) + (1|trialxcondition)

Table 14: Mobilized effort (AUC)

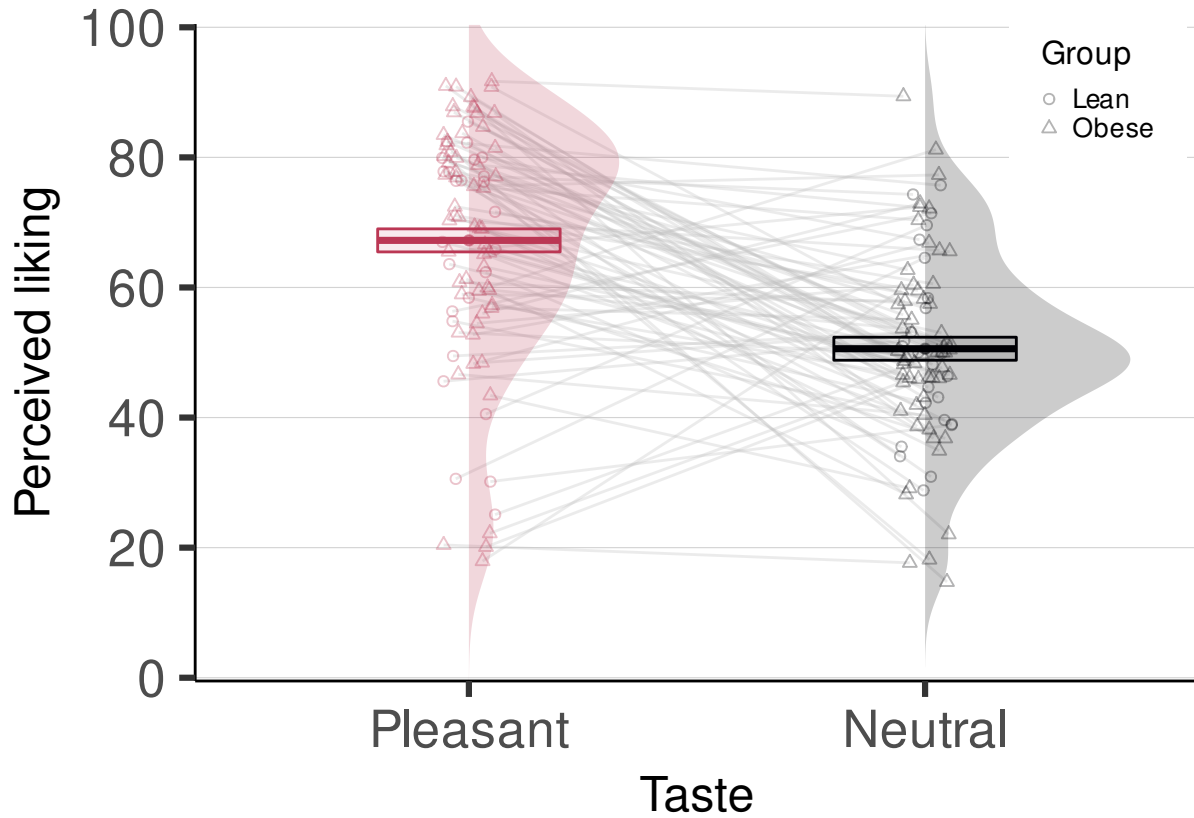
Predictors	Estimates	std. Error
condition [1]	7.877	1.354
group [1]	-1.792	1.450
hungry	2.447	1.331
familiarity	-2.520	1.239
intensity	-1.189	1.244
condition [1] * group [1]	-1.337	1.375
condition [1] * hungry	3.010	1.258

ICC	0.75
N id	84
N trialxcondition	20
Observations	3360
Marginal R2 / Conditional R2	0.202 / 0.798

Table 15: Parametric Bootstrap Test method to evaluate significance of fixed effects in mixed-effects models (using MLE fit, nsim = 500) and Bayes Factor from mixed models (see Wagenmakers, 2007)

Effect	df	Chisq	p.value	BF
condition	1	29.33 ***	<.001	2761448.95
group	1	1.60	.206	0.03
hungry	1	3.51 +	.061	0.03
familiarity	1	2.78 +	.096	0.07
intensity	1	0.96	.328	0.02
condition:group	1	0.97	.324	0.01
condition:hungry	1	5.74 *	.017	0.34

Pleasantness Ratings (Taste) by condition



Pleasantness Ratings over time

