

Identical sound, different learned expectation

a Different histories

EXPOSURE BEFORE THE TEST

History 1

After cue X: $P(\text{target A}) = 1/2$



Assigned cue–continuation distribution

History 2

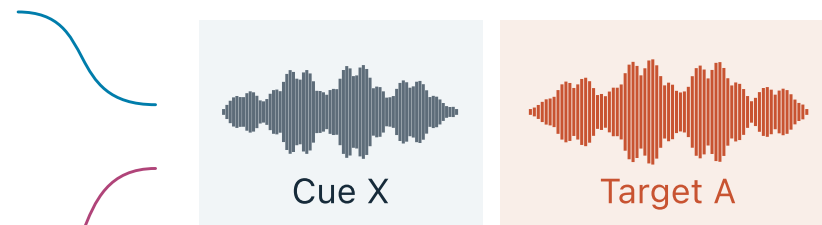
After cue X: $P(\text{target A}) = 1/8$



Assigned cue–continuation distribution

b The same test sound

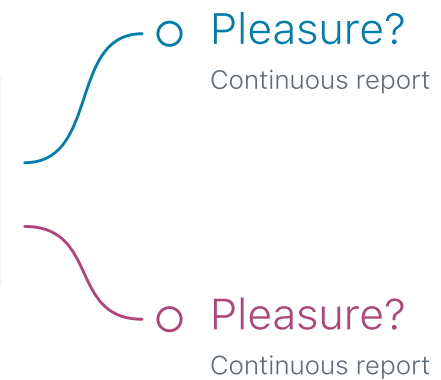
WAVEFORM HELD CONSTANT



One recording. Two learned meanings.

c The human response

TO BE MEASURED



Counterbalanced across listeners

Targets A and B have equal overall exposure.

Figure 1. Two counterbalanced exposure histories assign different probabilities to the same target after the same cue. The subsequent cue–target waveform is unchanged. Pleasure is measured, not assumed. Audio glyphs are schematic; no participant results are shown.

Probability and uncertainty, independently varied

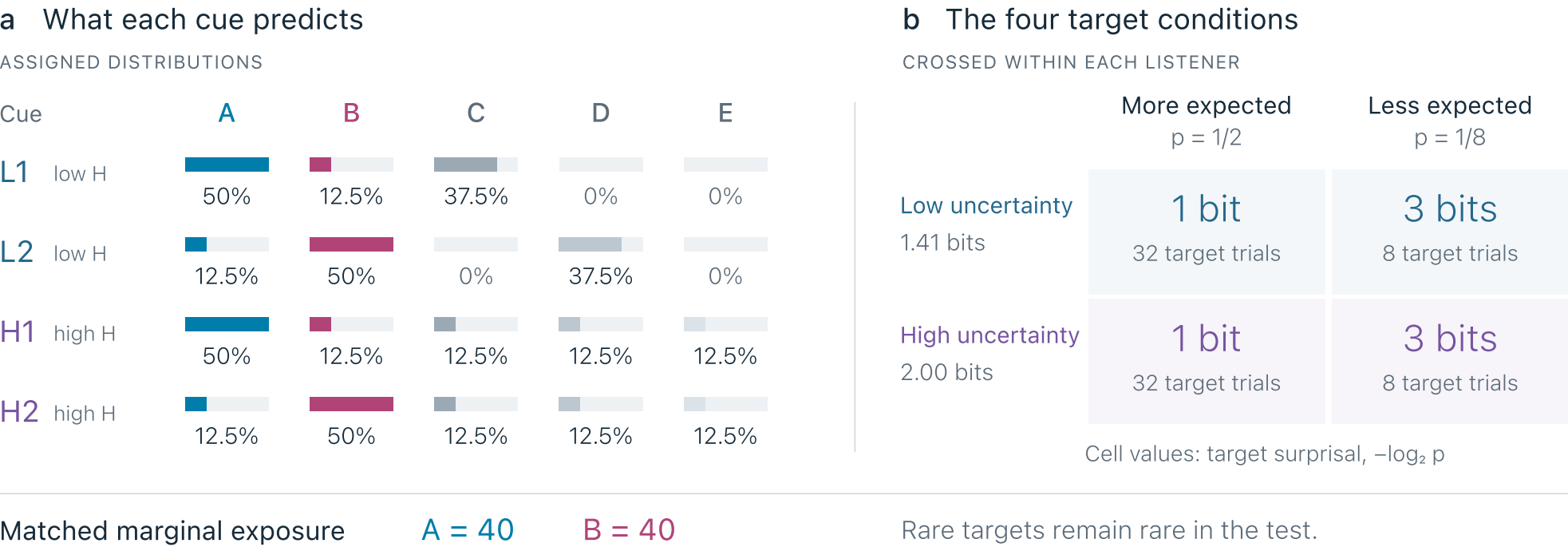
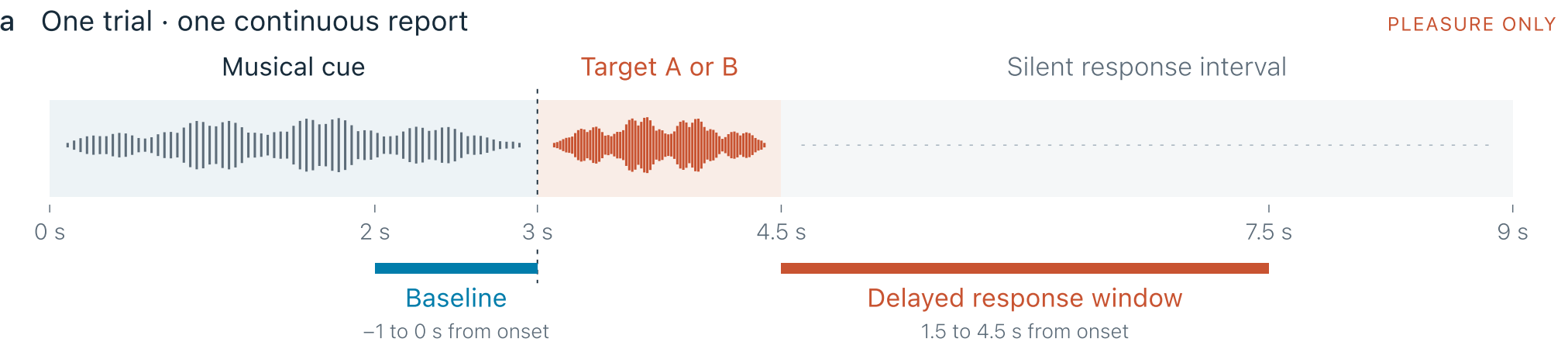


Figure 2. The exact planned distributions create low- and high-uncertainty contexts while retaining target probabilities of 1/2 and 1/8. Counts refer to the 128-trial test, not collected data. Equal overall exposure to A and B controls marginal familiarity; cue–target pair familiarity remains linked to probability.

A time-aligned behavioural outcome



$\Delta\text{Pleasure} = \text{mean response} - \text{mean baseline}$

Audio-clock alignment · 20 Hz sampling

Figure 3. Only continuous pleasure is reported during the primary test. Fixed baseline and response windows define the primary event-level outcome. The delay accommodates reporting; it does not establish the biological onset of pleasure. Prediction, resolution and replay reports occupy separate blocks.

The original Musical Intelligence architecture

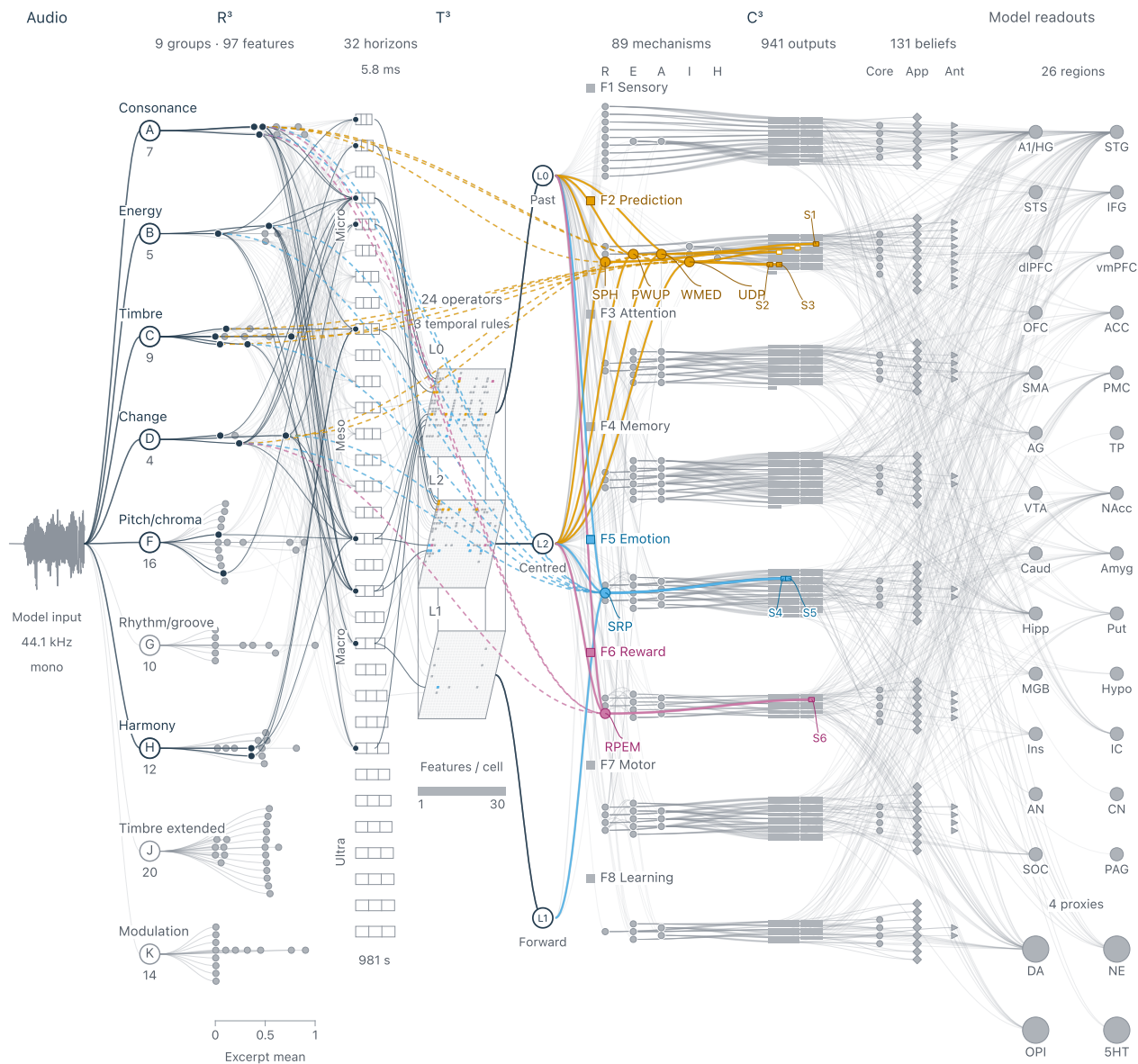


Figure 4. The manuscript map and its palette are retained without modification. Selected routes are coloured; unused routes remain gray. The six candidate scores use 17 R³ inputs and 49 T³ keys. The original figure contains archived illustrative excerpt values, not results from this experiment. Brain-region and chemical outputs are outside the study readout.

What each model is allowed to explain

a Two sources of evidence



b Matched model comparison

	A	B	C	D
	Acoustics	+ MI	+ learning	+ learning + MI
R^3 / T^3 drivers + trial position	✓	✓	✓	✓
Six prespecified MI scores	—	✓	—	✓
Sequential cue–continuation learner	—	—	✓	✓

$B - A$

Incremental MI representation

$D - C$

MI beyond an explicit learning account

c Generalisation to unheard musical families



Current MI: offline audio representation.

Identical audio alone cannot encode different learning histories.

Figure 5. All models share acoustic access and fitting budgets. MI features are tested both without and with a separate exposure-history learner. Entire musical families and their listeners are withheld together. This compares predictive usefulness; it does not establish biological identity. Audio and history glyphs are schematic. No performance estimates are shown.