Stochastic modeling of neurophysiological and behavioral data: attention and decision making in rats

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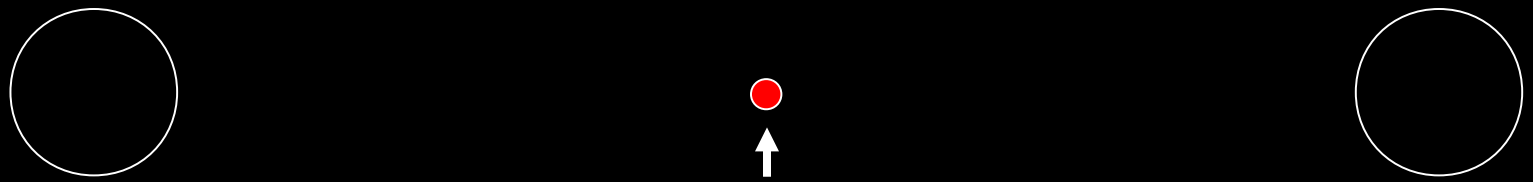
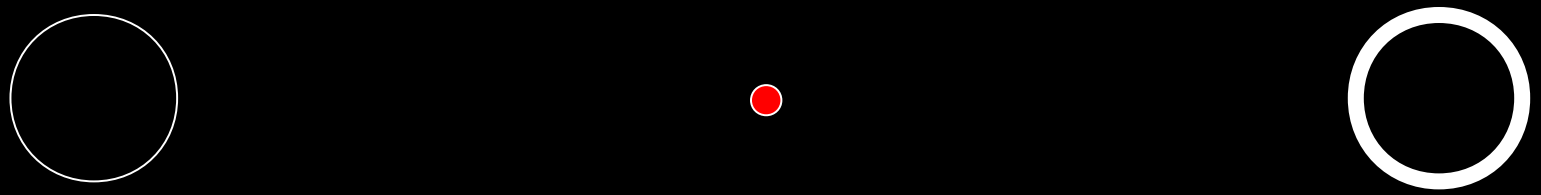
Covert attention task (Posner, 1980)

Peripheral valid (80%) cue

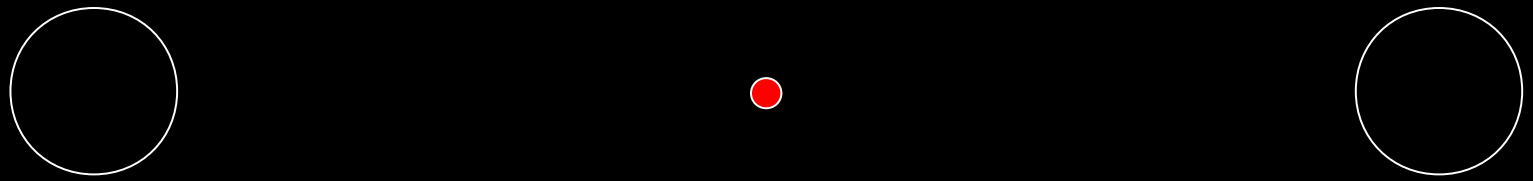


Peripheral valid cue



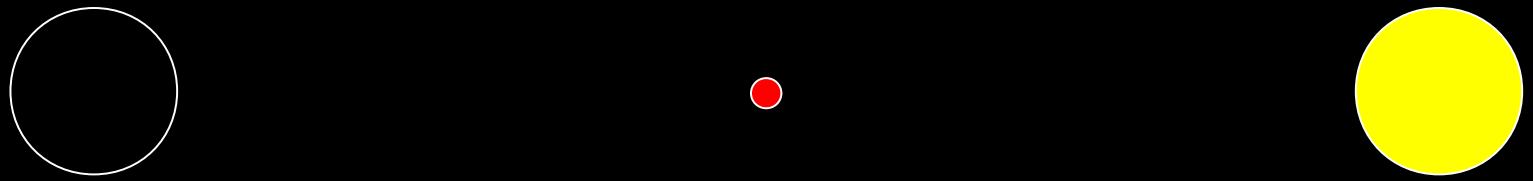
50-200 ms

Peripheral valid cue



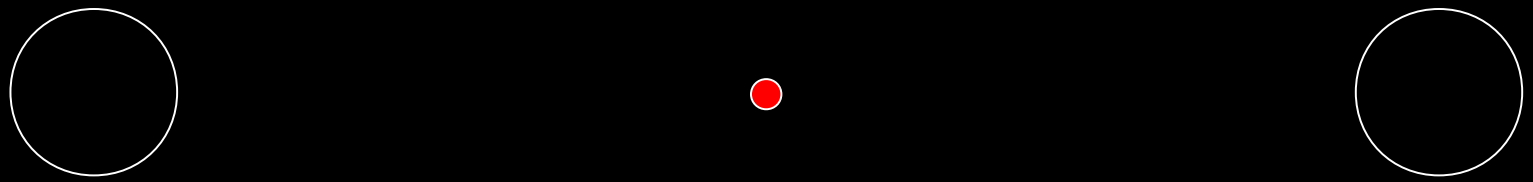
Variable time interval
(ms)

Peripheral valid cue

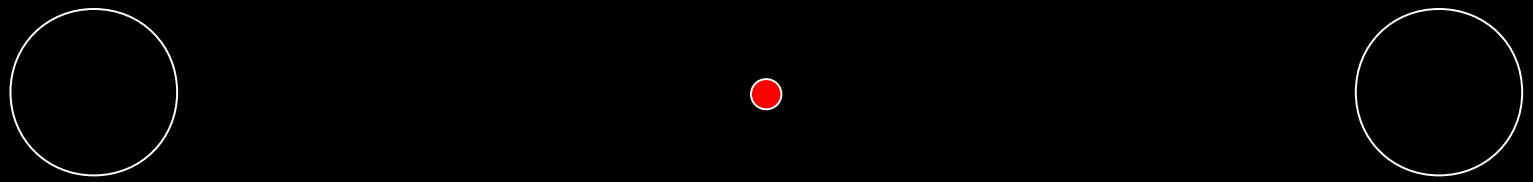


50-200 ms

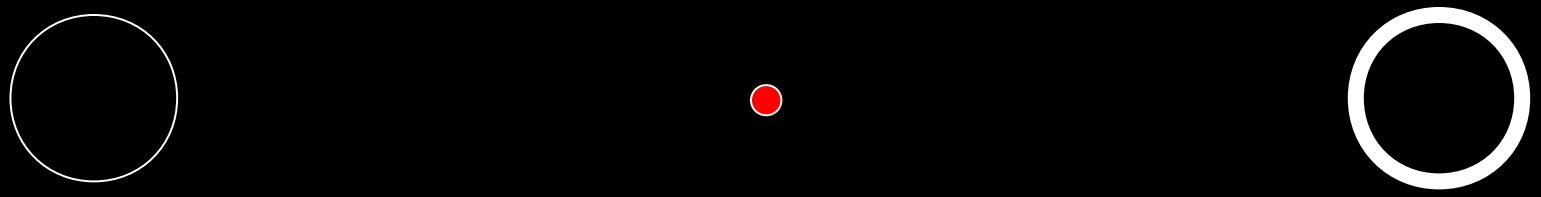
Peripheral valid cue



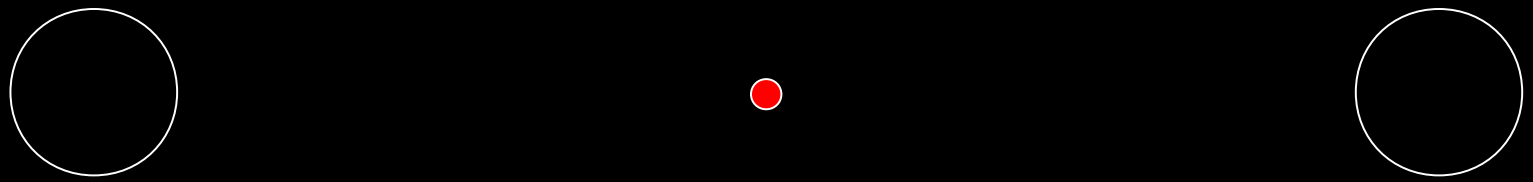
Peripheral invalid (20%) cue



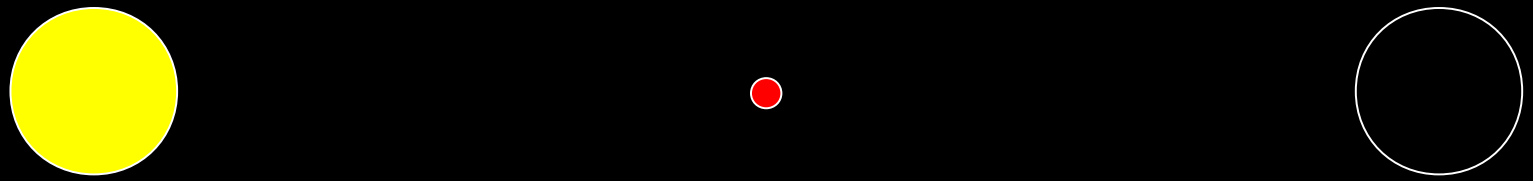
Peripheral invalid cue



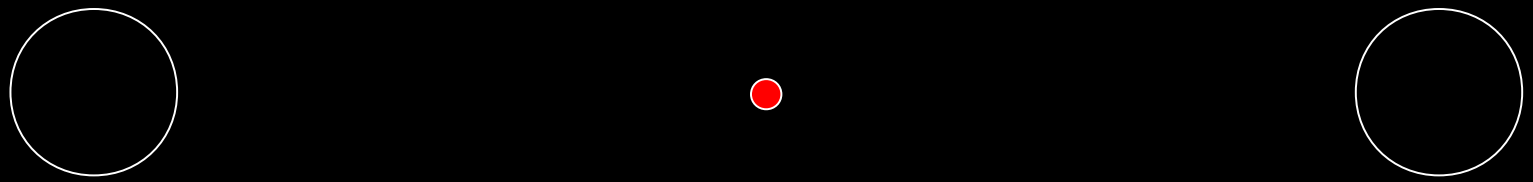
Peripheral invalid cue



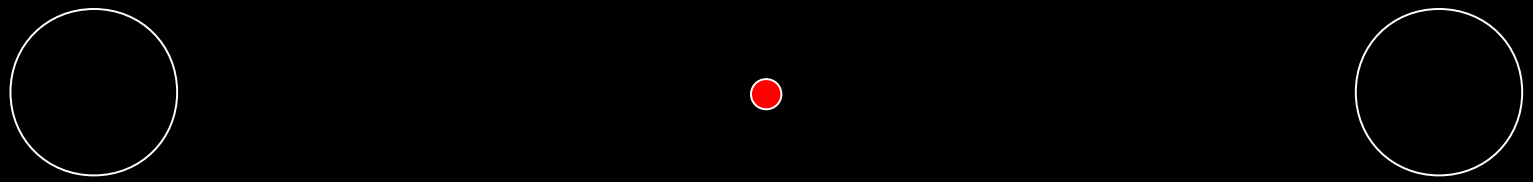
Peripheral invalid cue



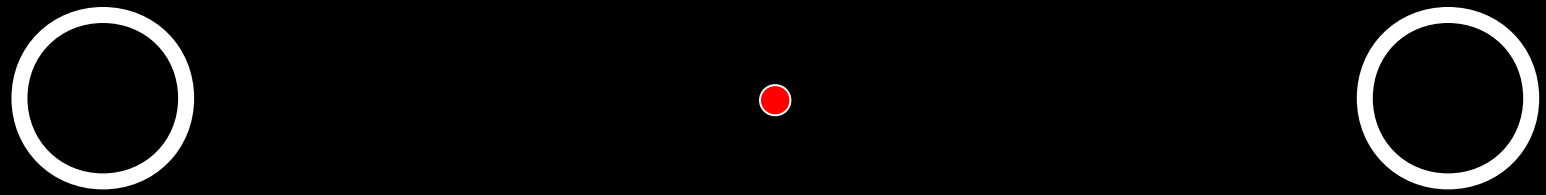
Peripheral invalid cue



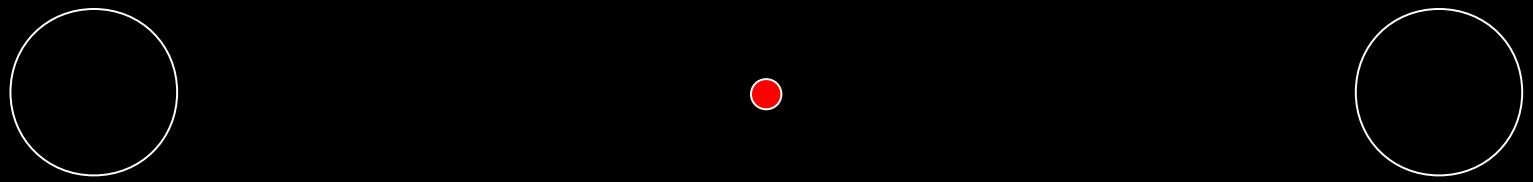
Peripheral neutral cue



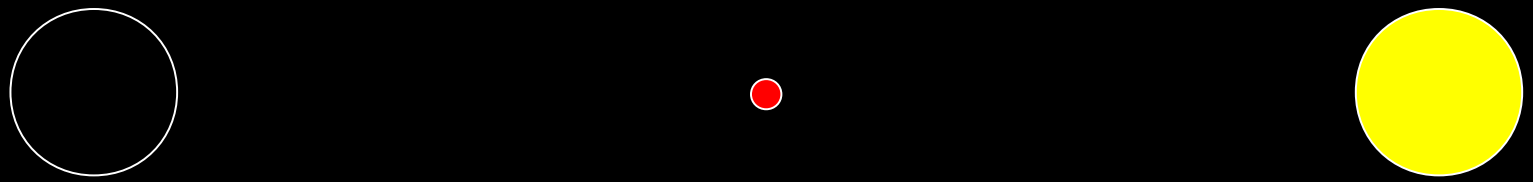
Peripheral neutral cue



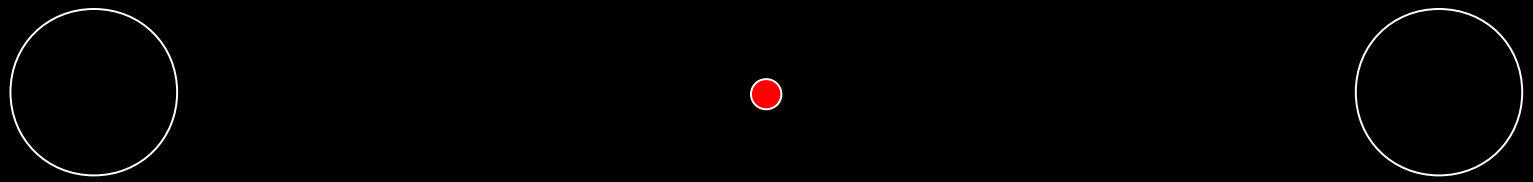
Peripheral neutral cue



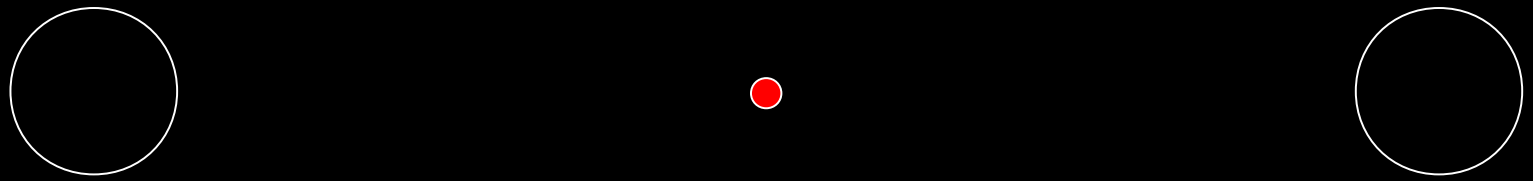
Peripheral neutral cue



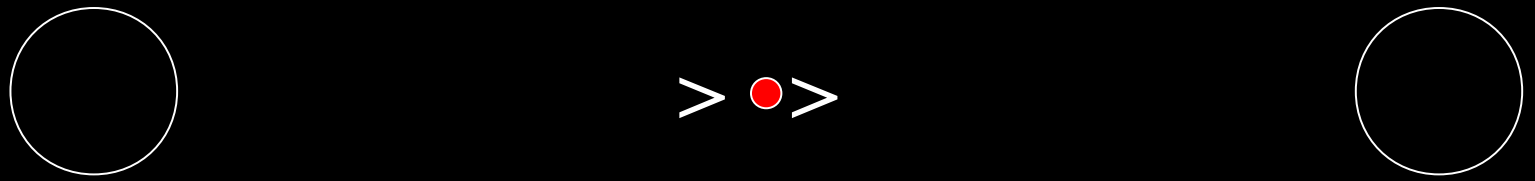
Peripheral neutral cue



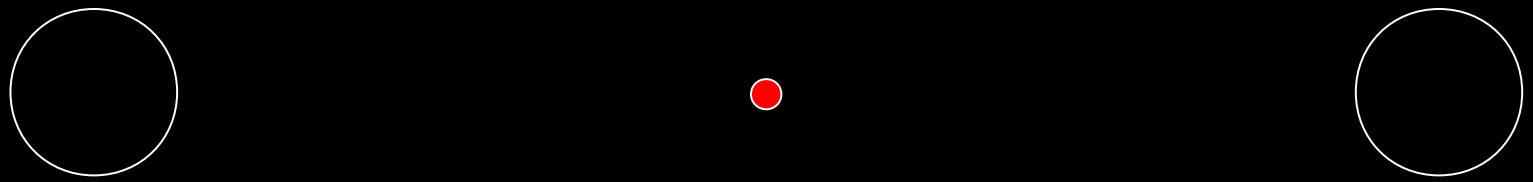
Symbolic valid (80%) cue



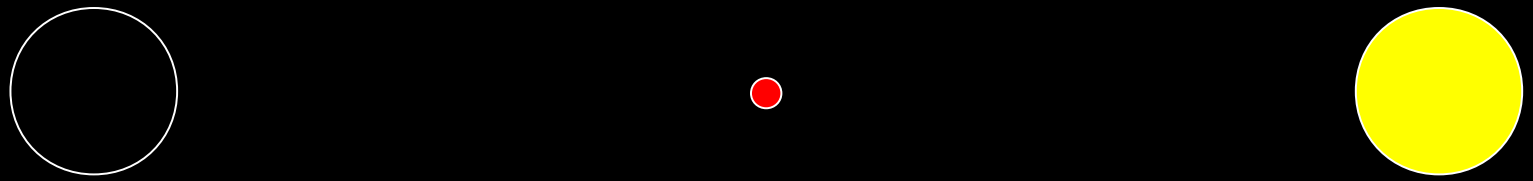
Symbolic valid cue



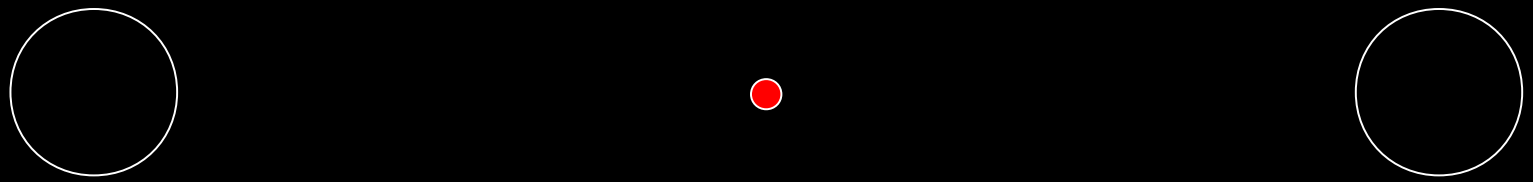
Symbolic valid cue



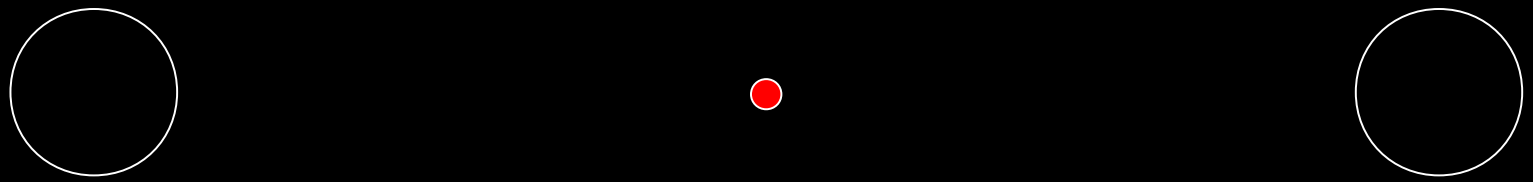
Symbolic valid cue



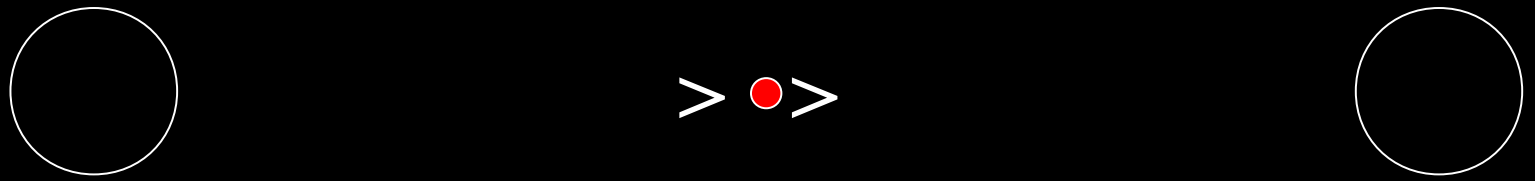
Symbolic valid cue



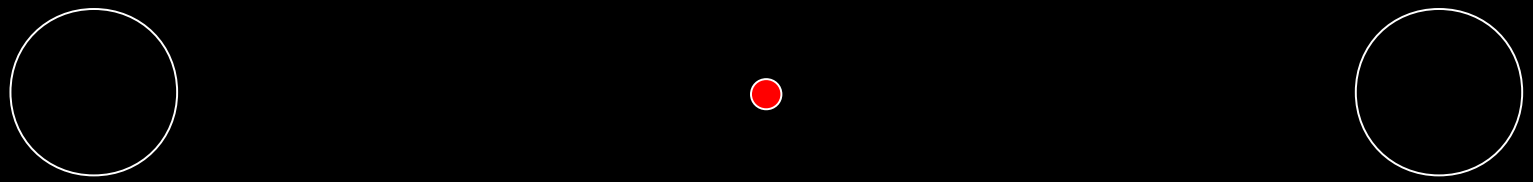
Symbolic invalid (20%) cue



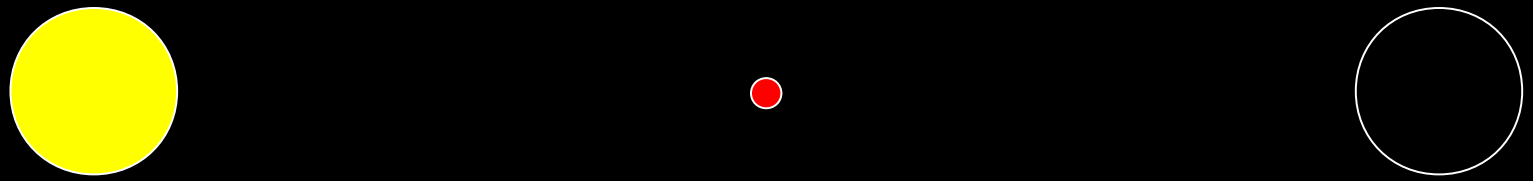
Symbolic invalid cue



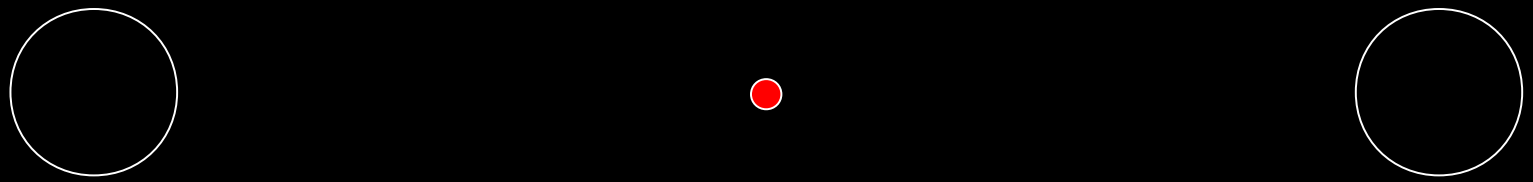
Symbolic invalid cue



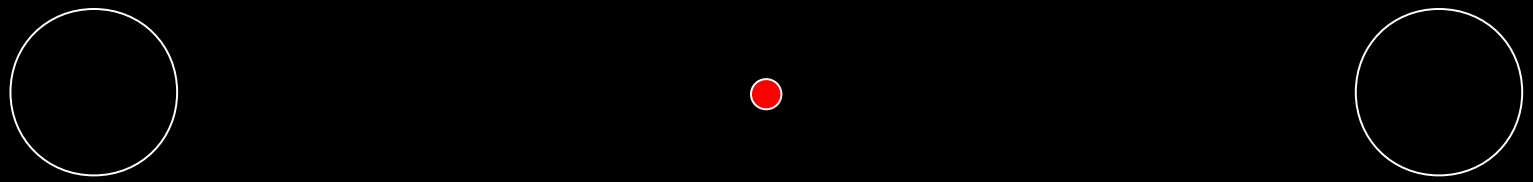
Symbolic invalid cue



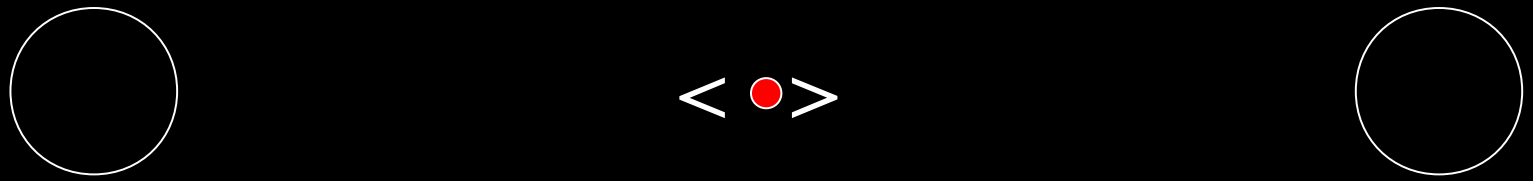
Symbolic invalid cue



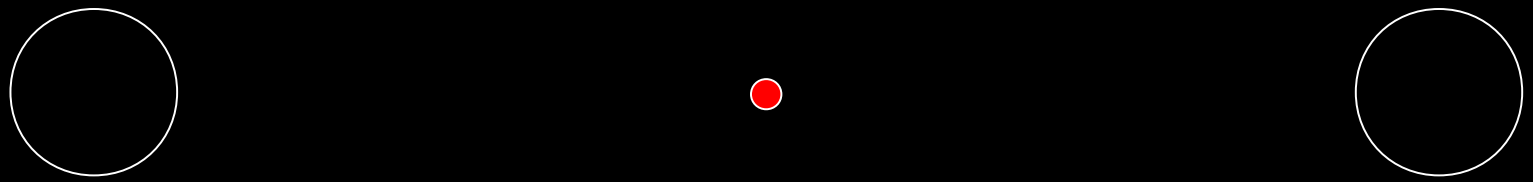
Symbolic neutral cue



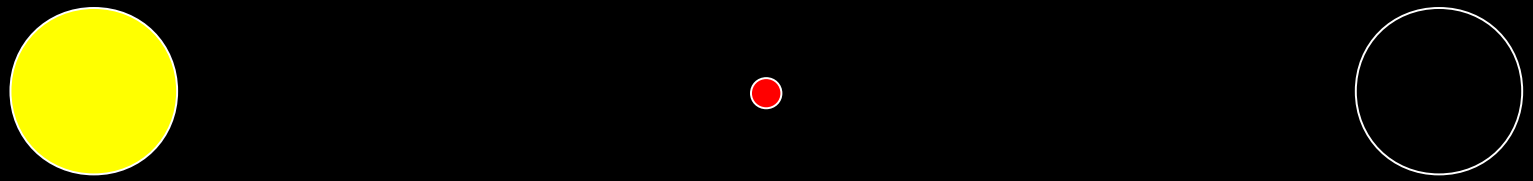
Symbolic neutral cue



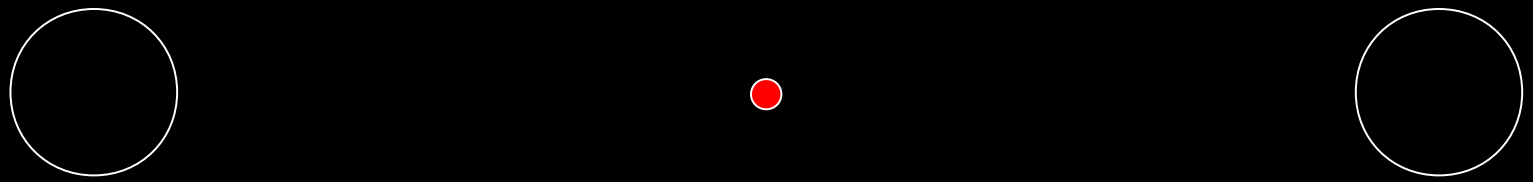
Symbolic neutral cue

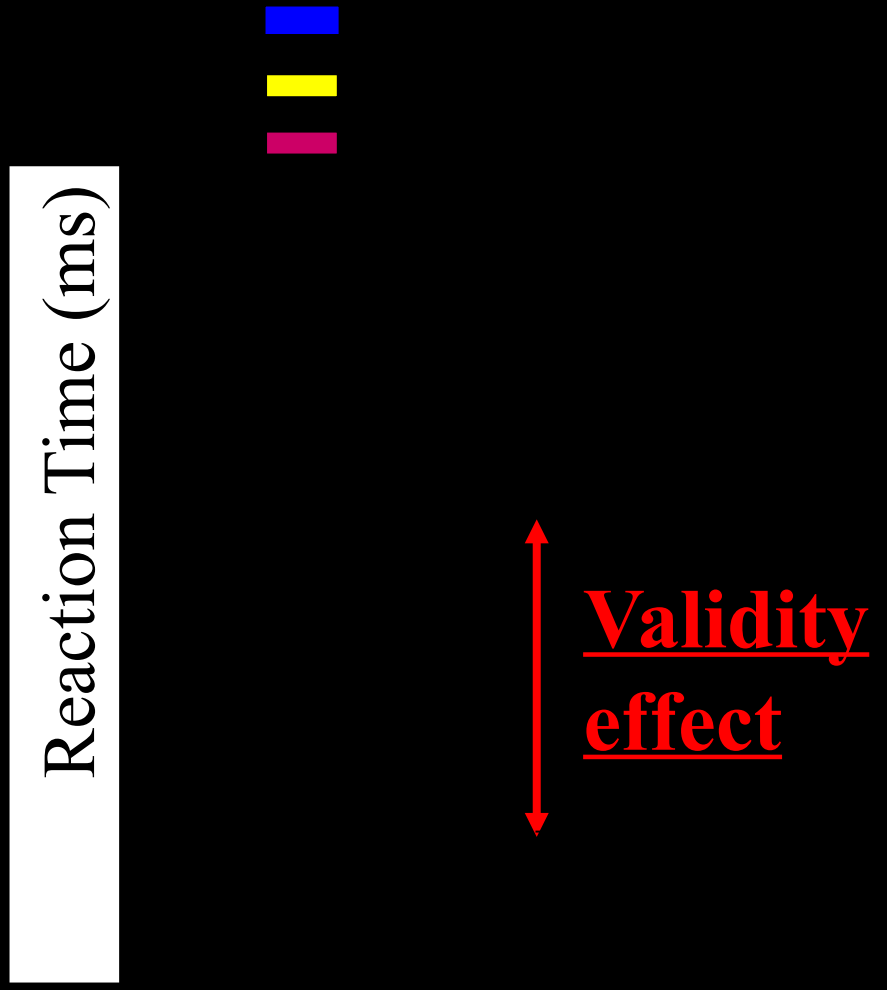


Symbolic neutral cue



Symbolic neutral cue



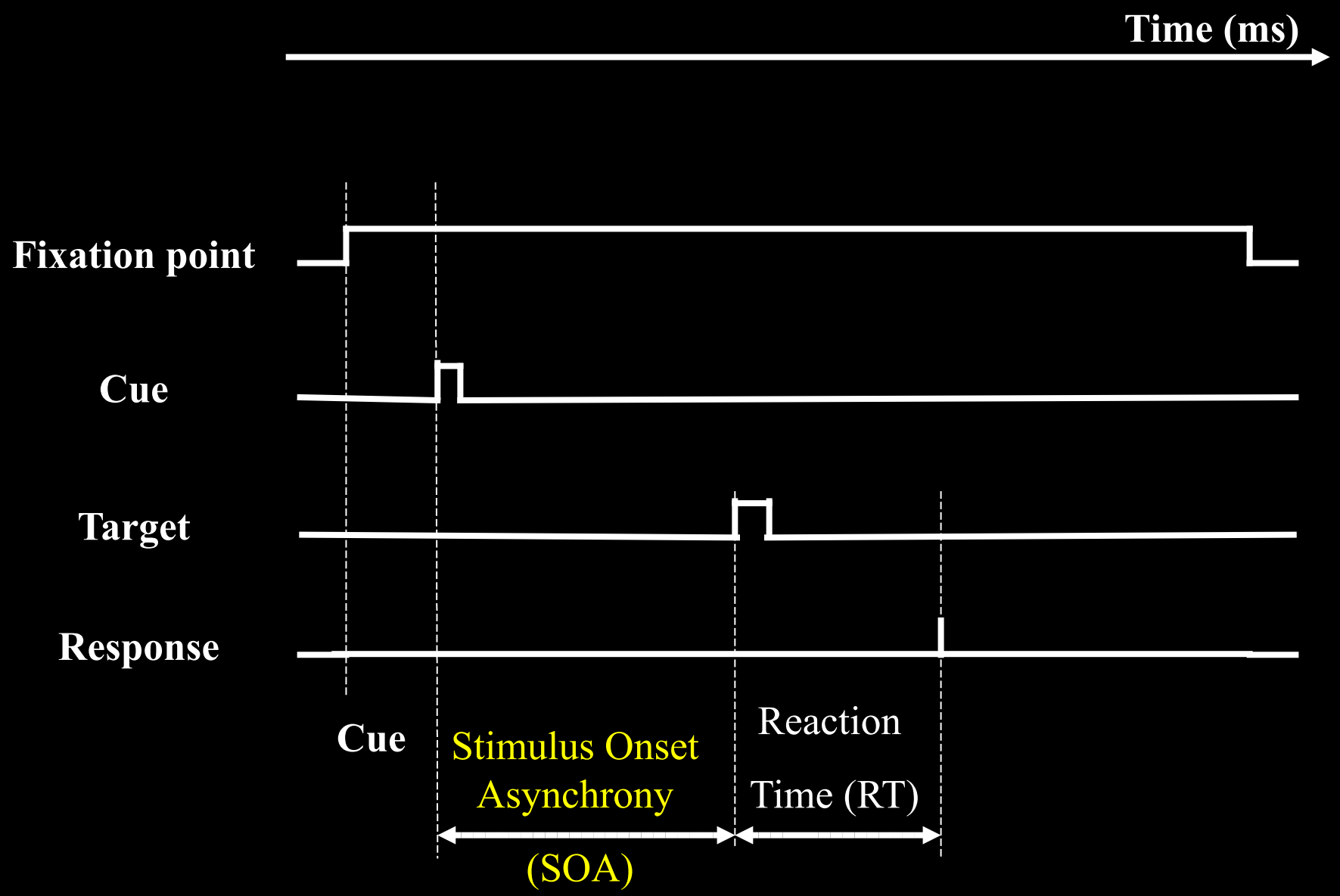

Reaction Time (ms)
Validity
effect

Advantages

Same sensory information in valid and invalid trials; therefore, differences are not related to sensory aspects.

Same response in valid and invalid trials; therefore, differences are not related to motor aspects.

Time course of a trial



[Predictive (80%V x 20%I) x

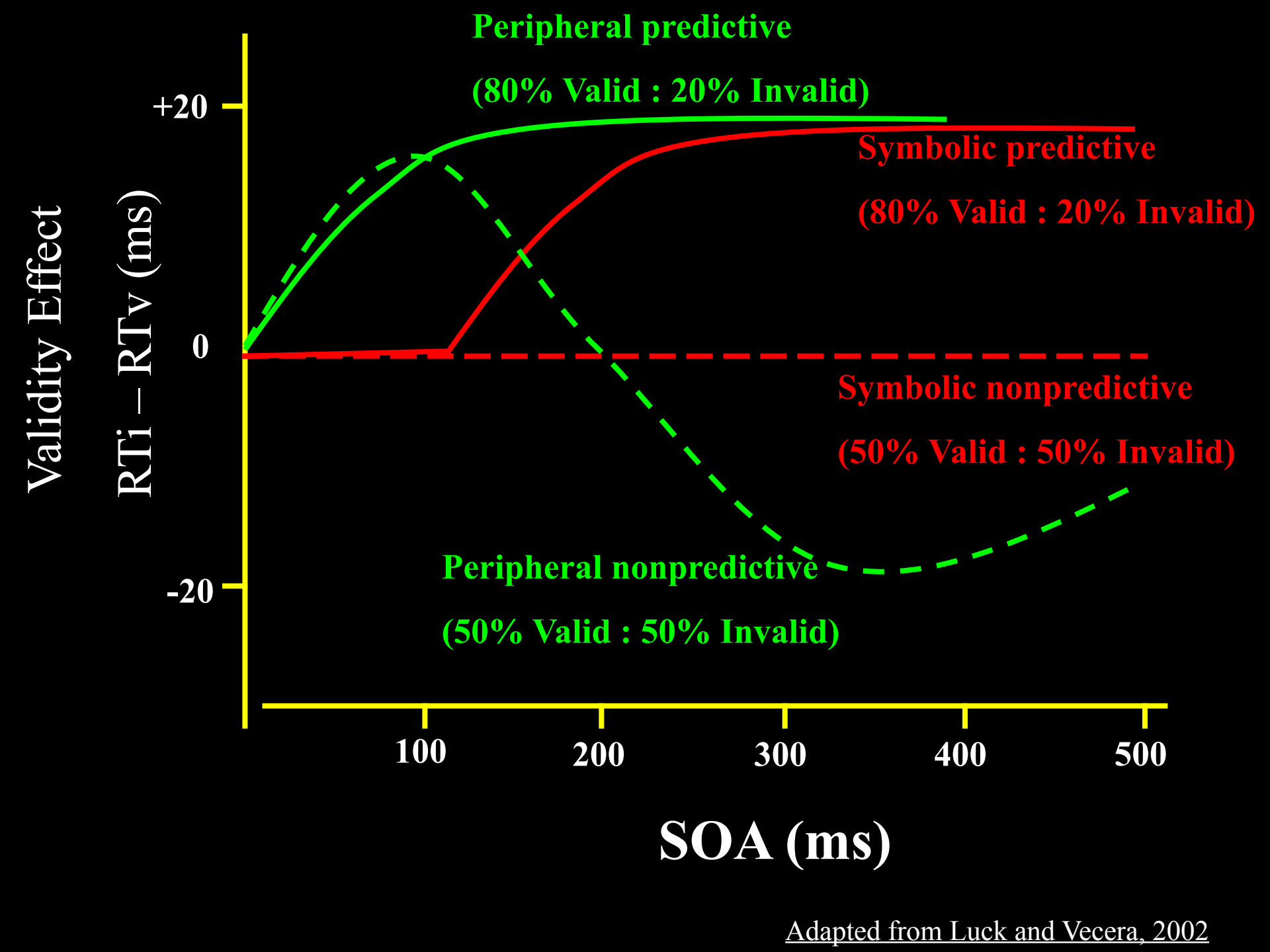
Nonpredictive (50%”V” x 50%”I”)]

X

[Symbolic x Peripheral]

X

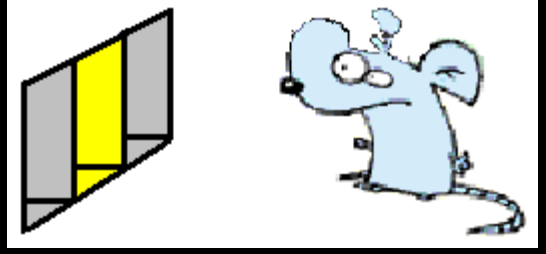
SOAs

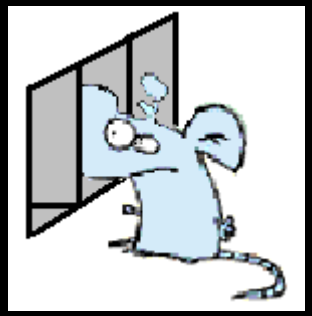


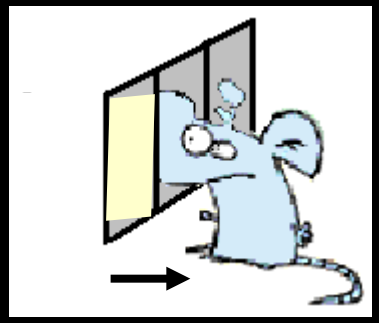
Adapted from Luck and Vecera, 2002

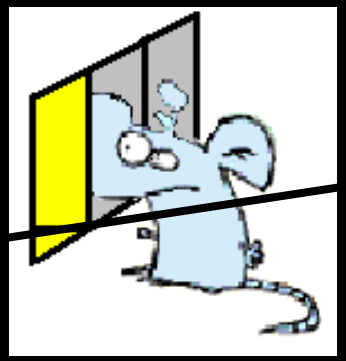
Orienting of attention in rats

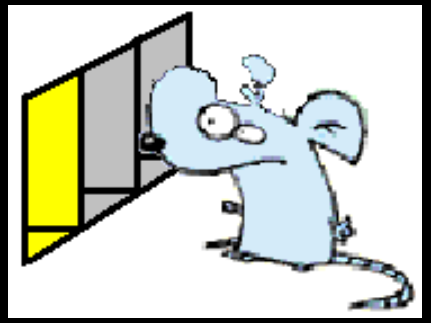
Peripheral cue



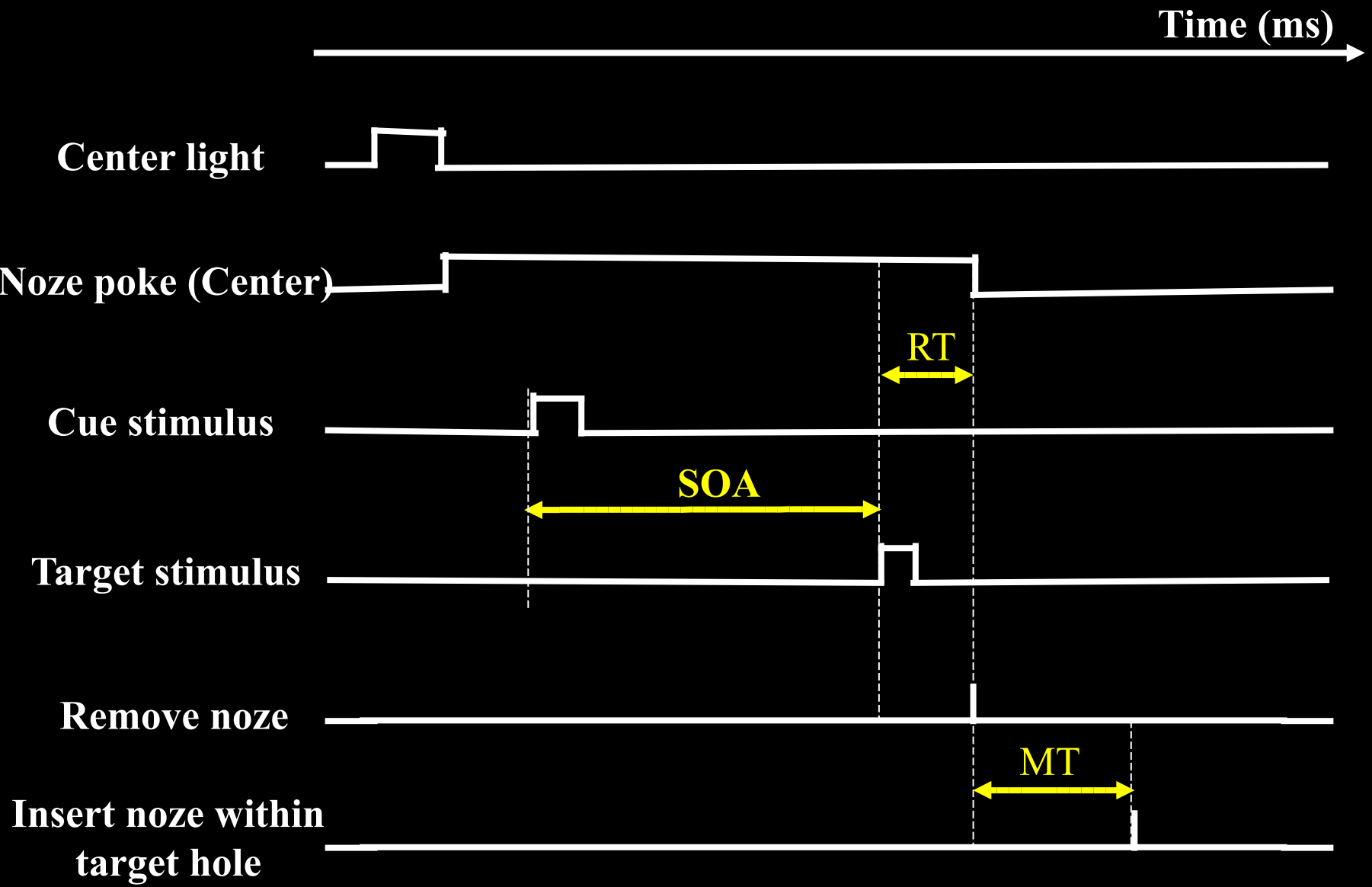








Time course of a rat trial



Anim Cogn (2011) 14:535–544
DOI 10.1007/s10071-011-0388-3

ORIGINAL PAPER

Endogenous-like orienting of visual attention in rats

Claudia Franco Olim Marote ·
Gilberto Fernando Xavier

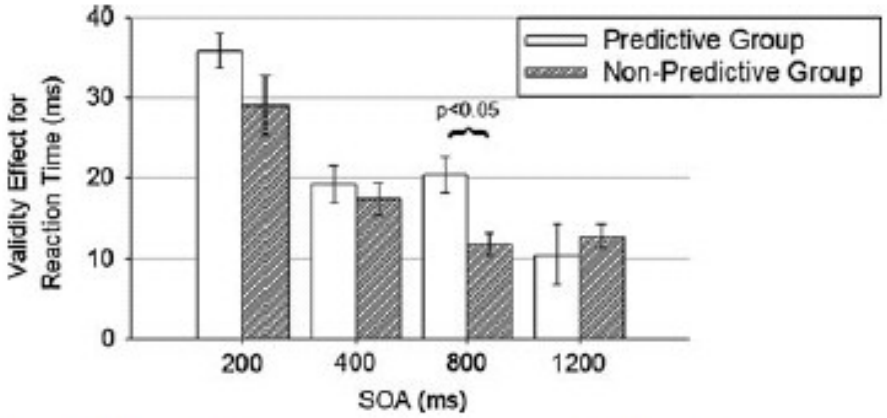
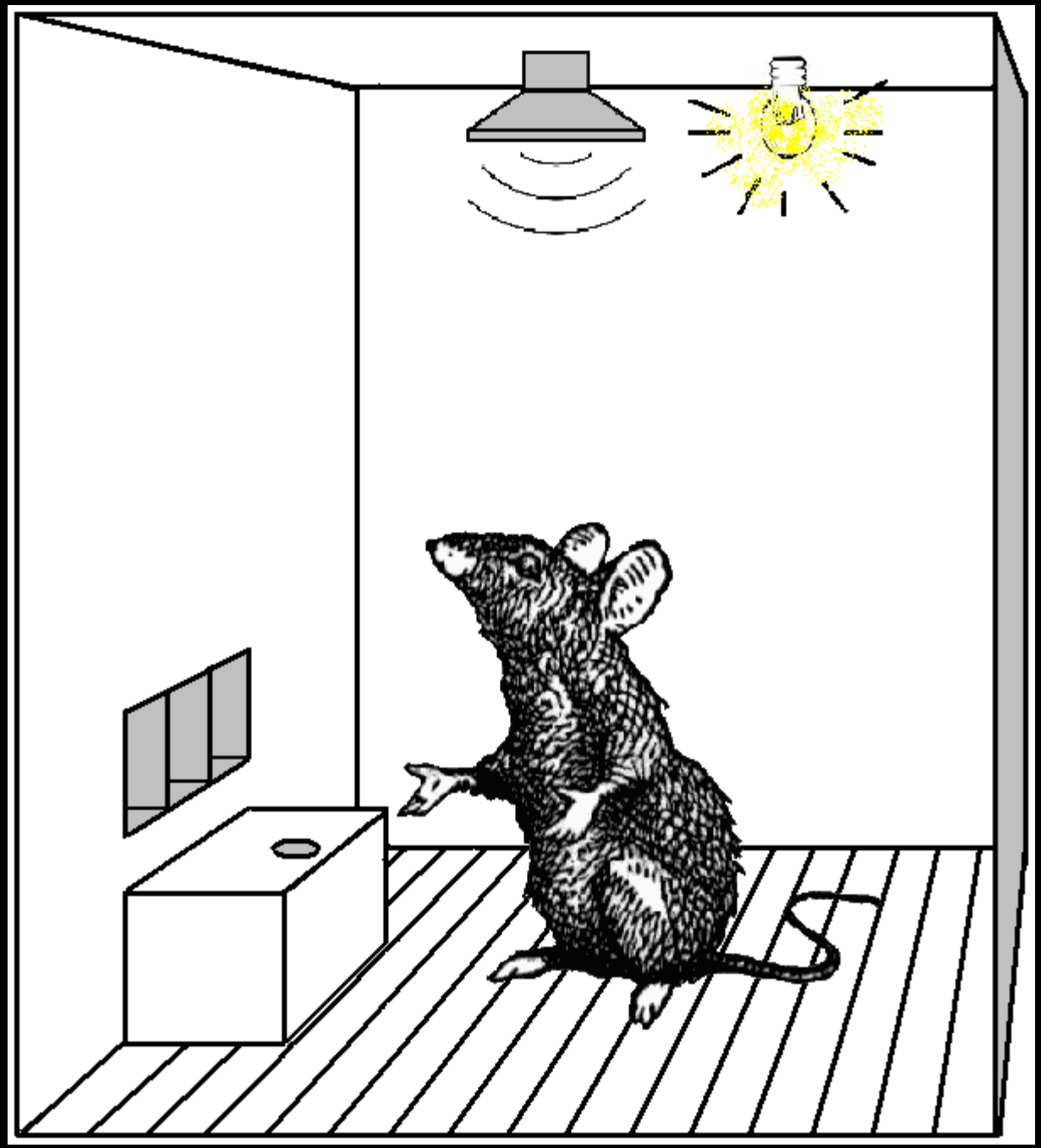
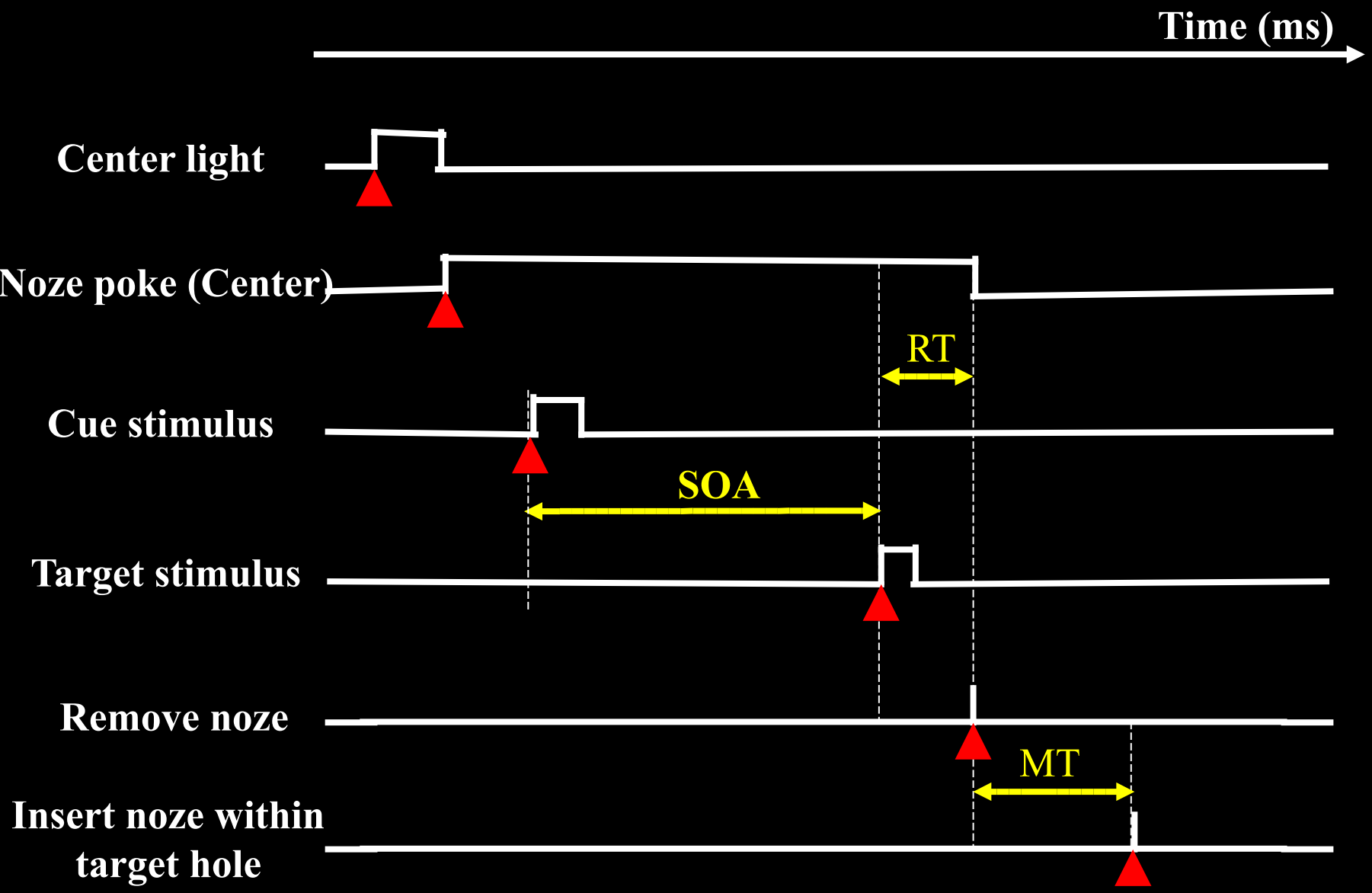


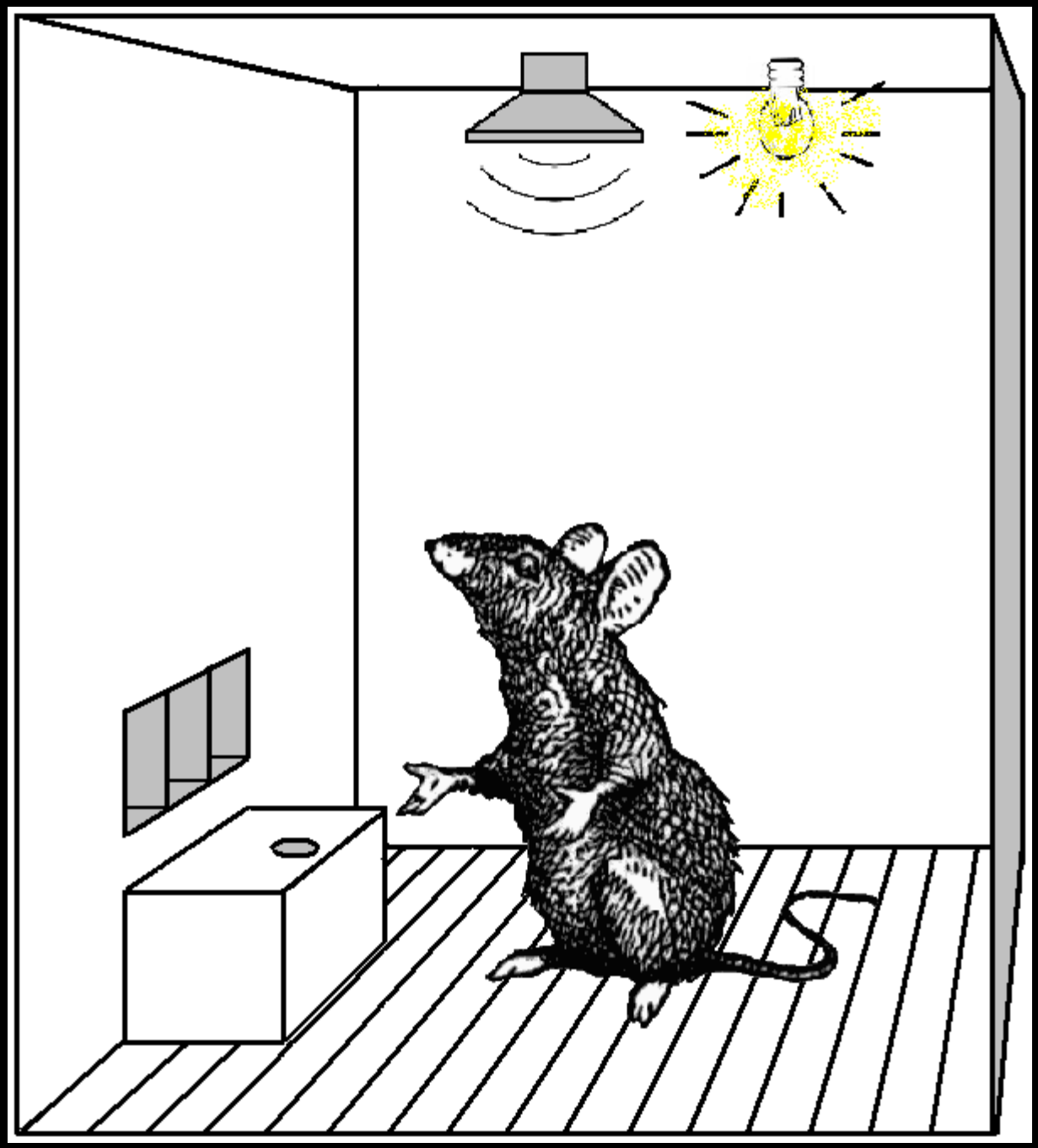
Fig. 2 Validity effect for reaction time (median reaction time in invalid trials minus median reaction time in valid trials ±S.E.M.) as a function of SOAs in testing sessions for subjects exposed to predictive (Predictive Group) and non-predictive (Non-Predictive Group) peripheral cues



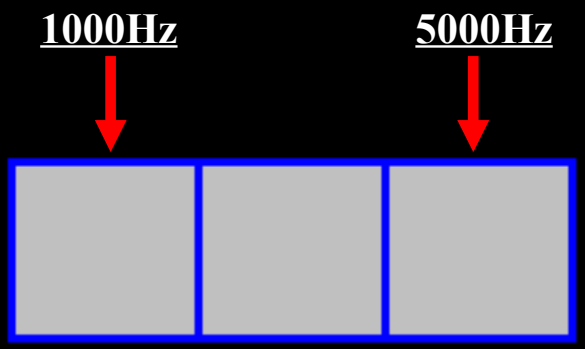
Multi-unit recordings in several brain areas

Time course of a rat trial

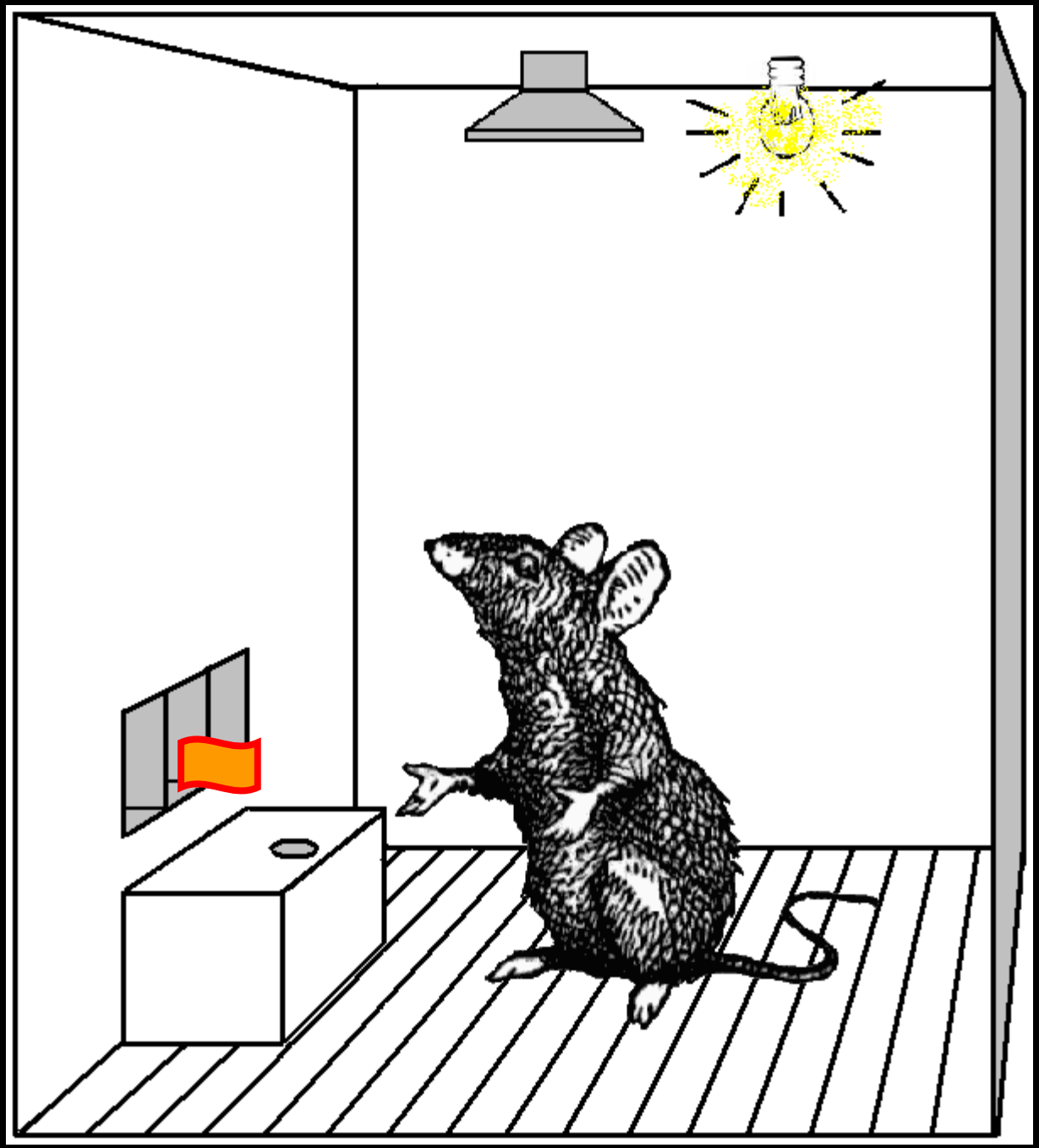


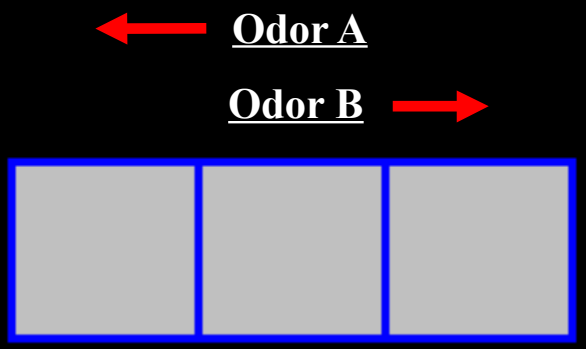


Symbolic cue using sounds

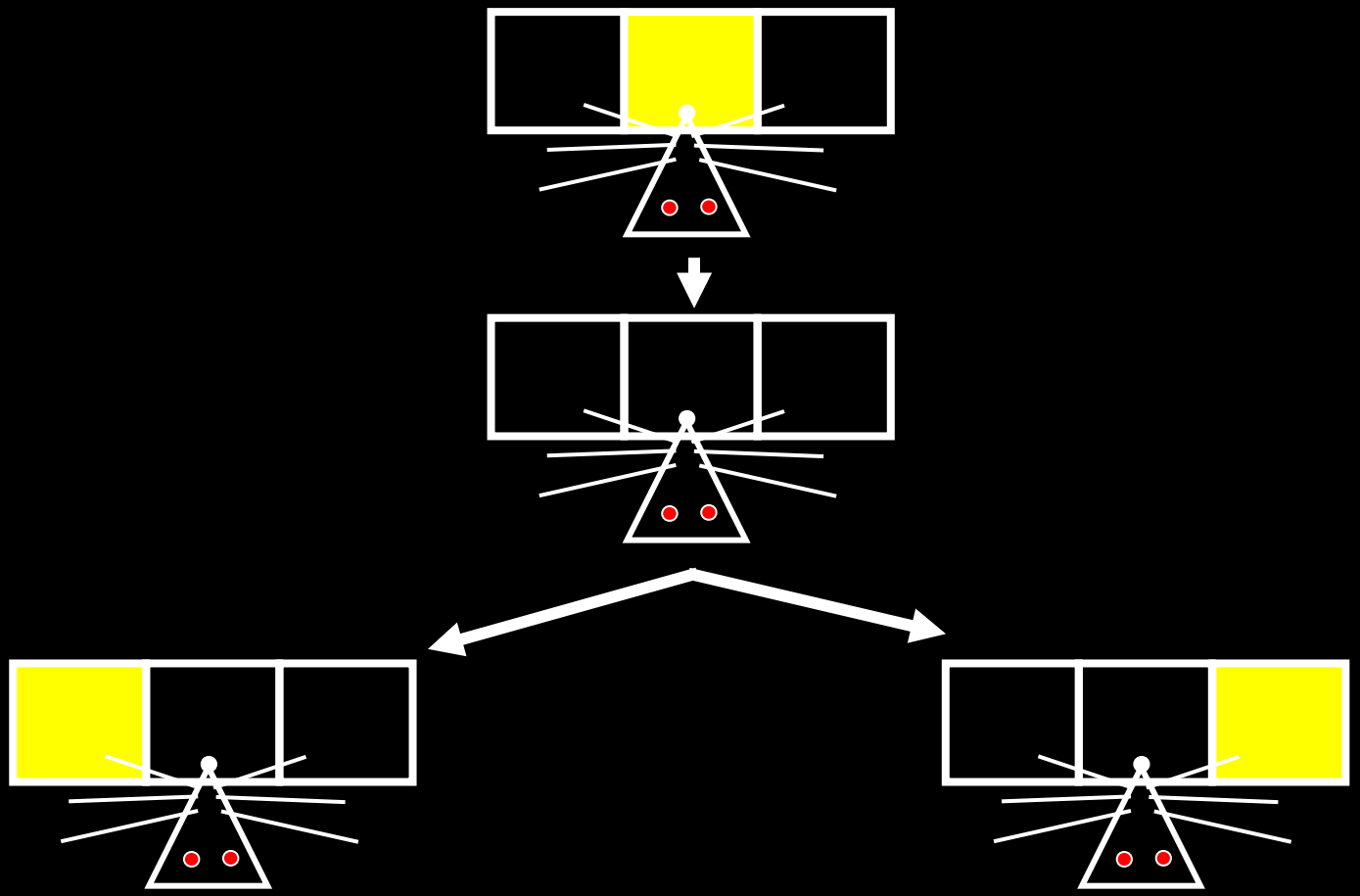


Symbolic cue using Odors





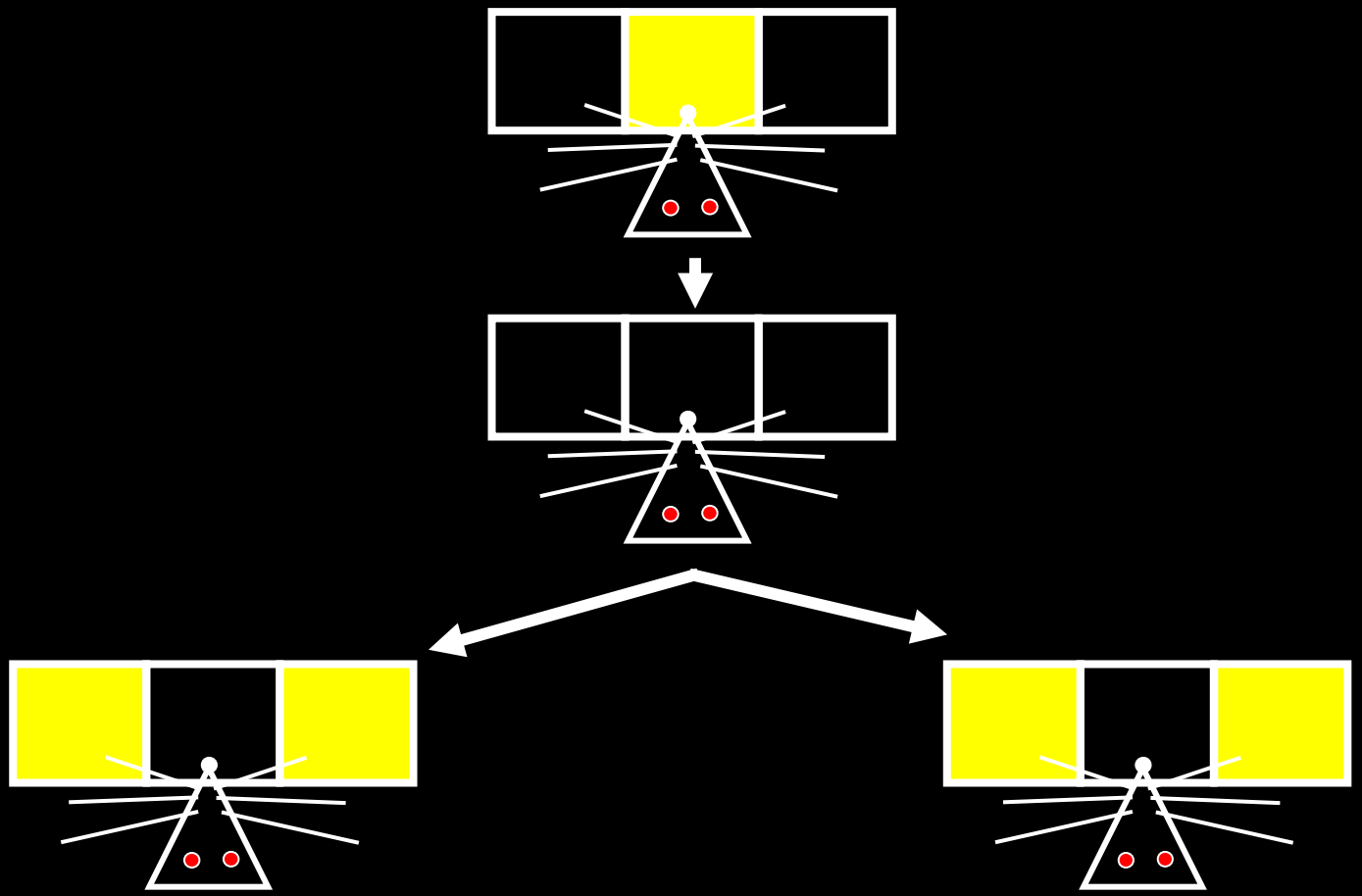
Decision making (Forced Trial)



one reward
immediately

four rewards
after a delay

Decision making (Choice Trial)



?

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Serial Reaction Time Task

(slow motion and real time)

Click

Thank you for your ATTENTION