

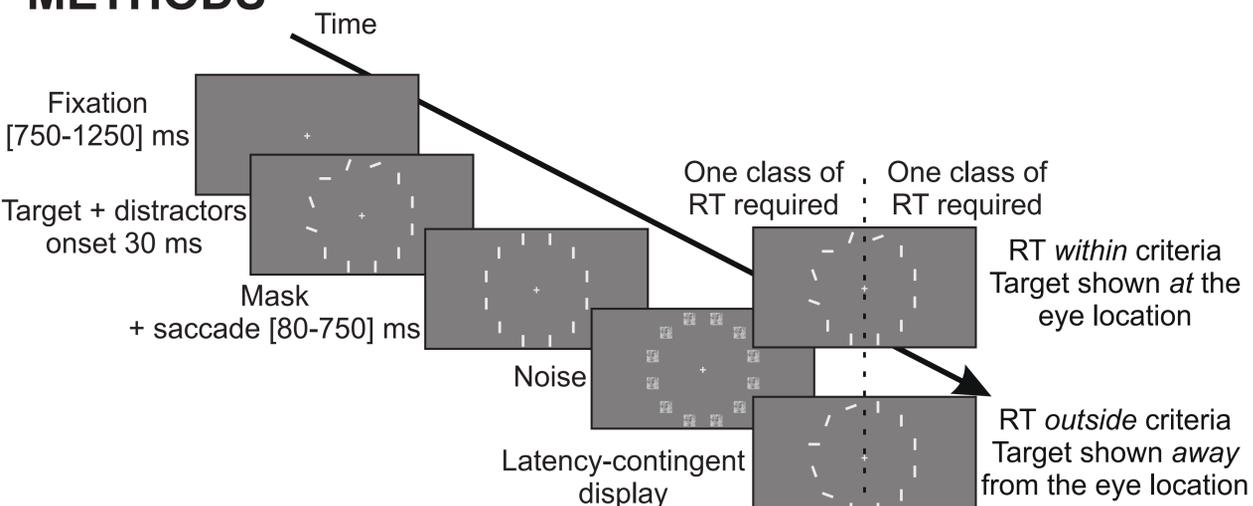
# Discriminative Control of Saccadic Reaction Times in a Latency-Contingent Visual Search Task

## INTRODUCTION

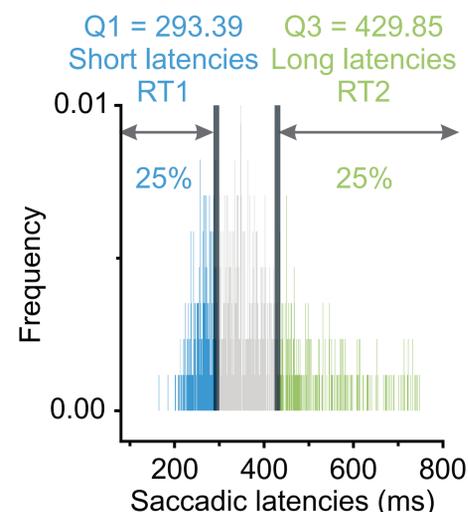
Saccadic eye movements may be regarded as an observing behavior mostly concerned with the spatial localization of information. However, recent studies have shown that they are also affected by the temporal regularities in dynamic environments (e.g. Hoppe & Rothkopf, 2016; Vullings & Madelain, 2016).

Here, we probe whether discriminative control of saccadic reaction times can be established using a latency-contingent visual display in a search task.

## METHODS



Using the individual baseline latency distributions, we defined short and long latencies



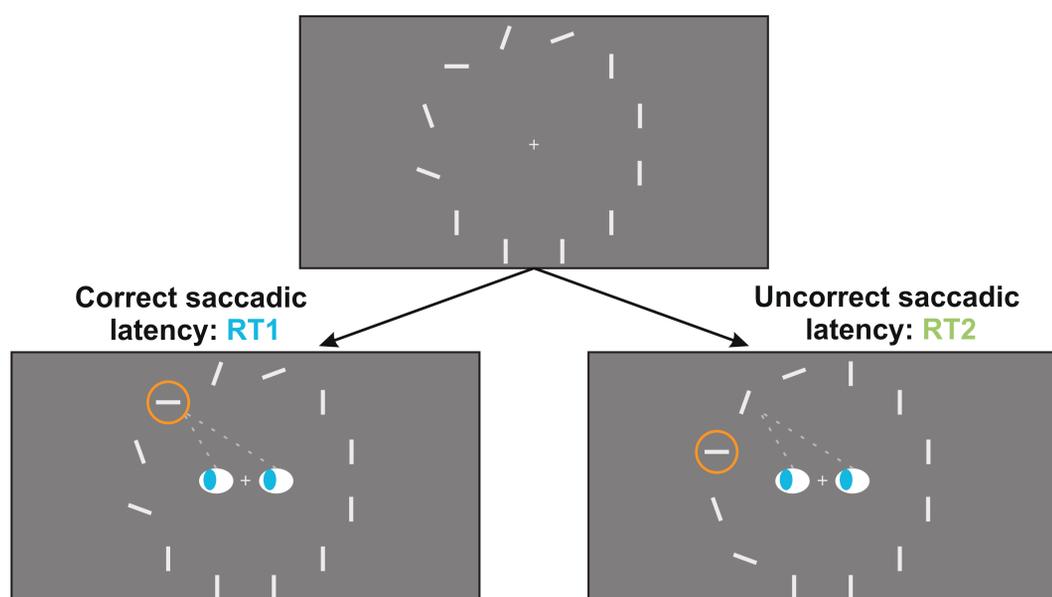
Procedure: multiple schedule of continuous reinforcement with 2 components

		Discriminative stimuli	
		Left side	Right side
Experimental group	Group 1	RT1	RT2
	Group 2	RT2	RT1

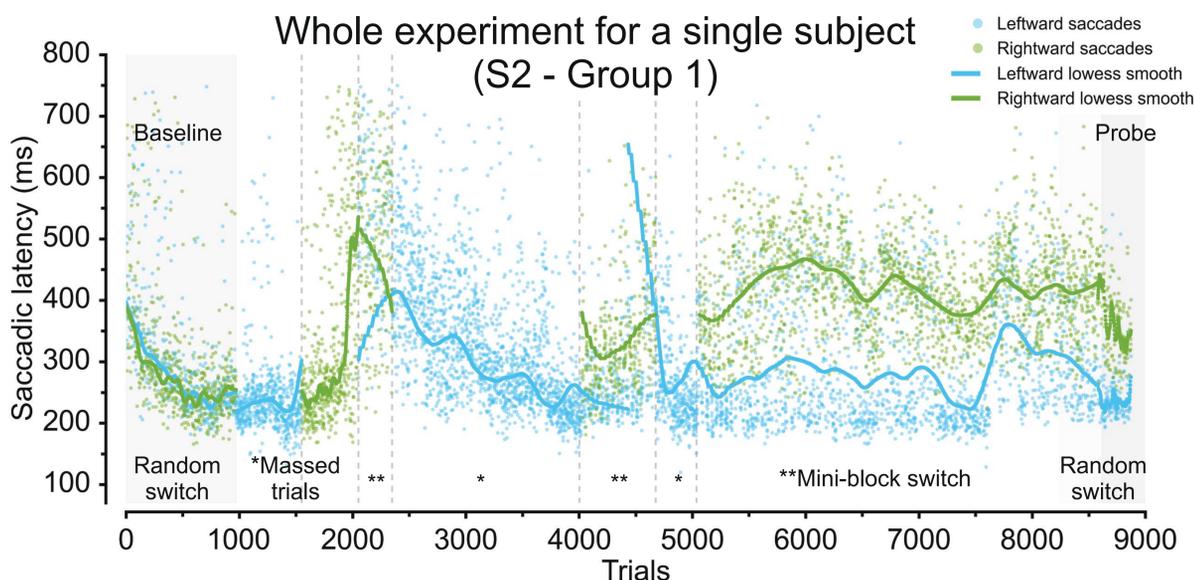
For discrimination training, we:  
1) massed trials on one side of the screen (left then right),  
2) alternated blocks of consecutive left/right trials and progressively decreased their length (24-12-6-3-random).

- 384 trials per session
- 30 sessions per subject
- Reinforcer = target display + 0.02€ associated with a sound

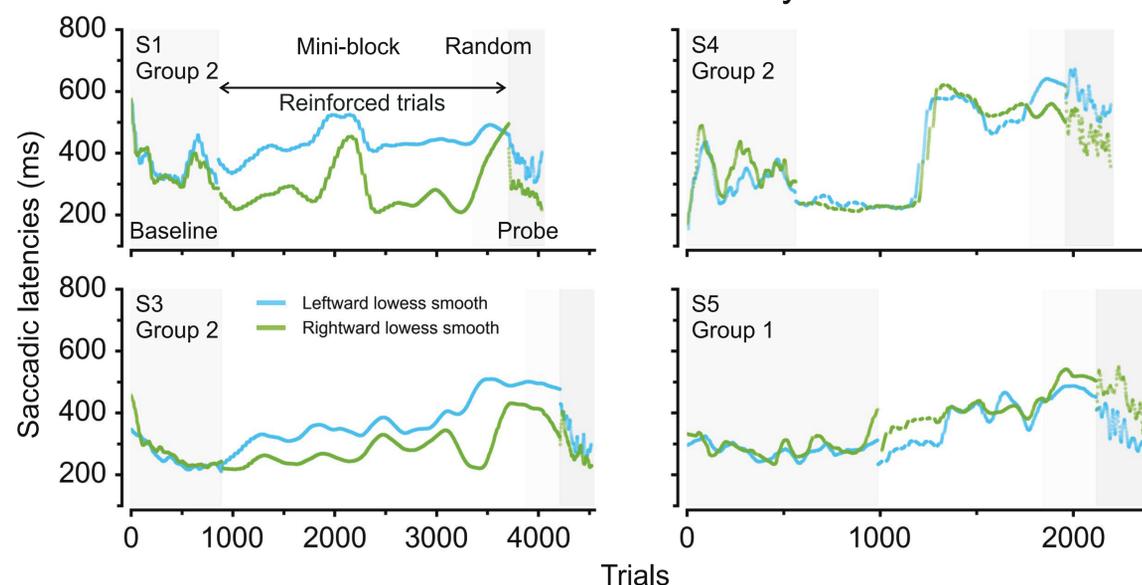
### Instance of latency-contingent display for group 1



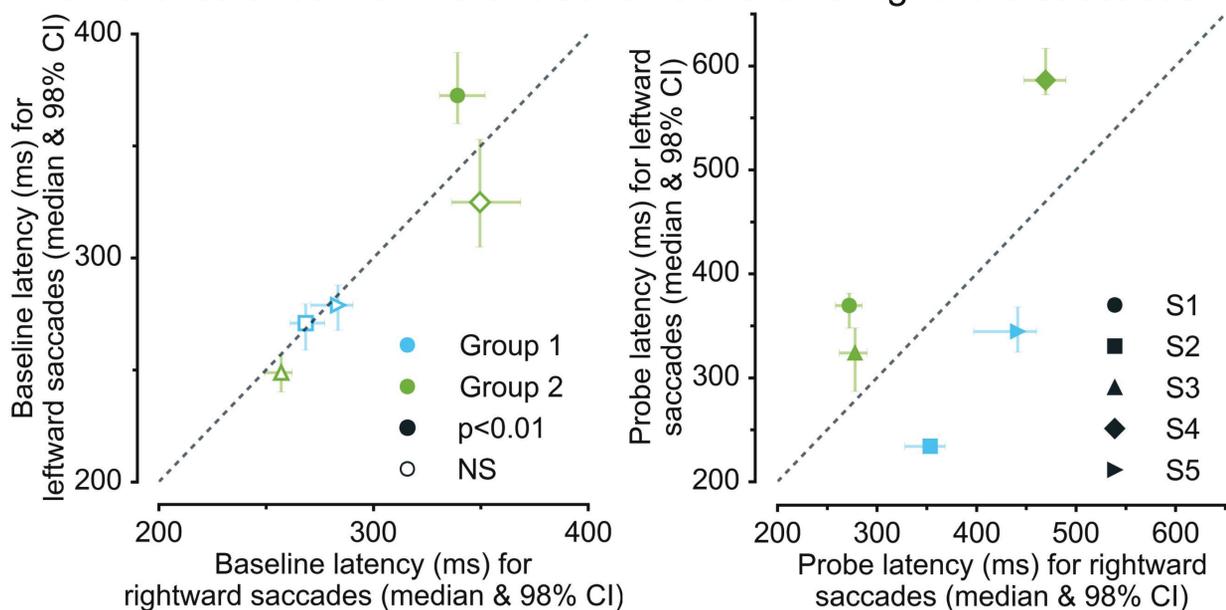
## RESULTS



### Saccadic reaction times can be controlled by discriminative stimuli



### Difference of 95 ms in latencies for leftward vs. rightward saccades



## CONCLUSION

- Saccadic latencies can be put under stimulus control, which further confirms the operant nature of saccades.
- Saccade triggering is finely controlled by learned temporal and spatial properties of the environment.

## REFERENCES

Hoppe & Rothkopf (2016). Learning rational temporal eye movement strategies. *PNAS*.  
Vullings & Madelain (2016). Saccadic latency and choice in a concurrent random interval reinforcement schedule. *Journal of Vision*.