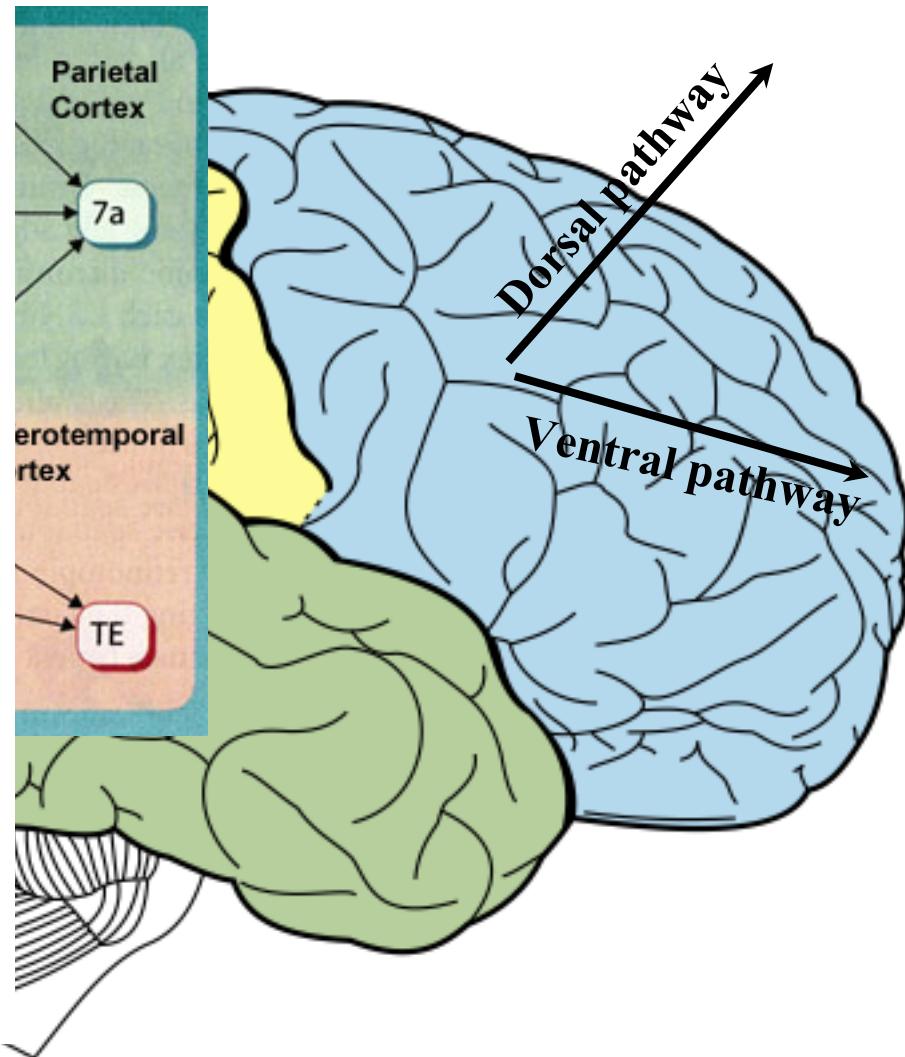
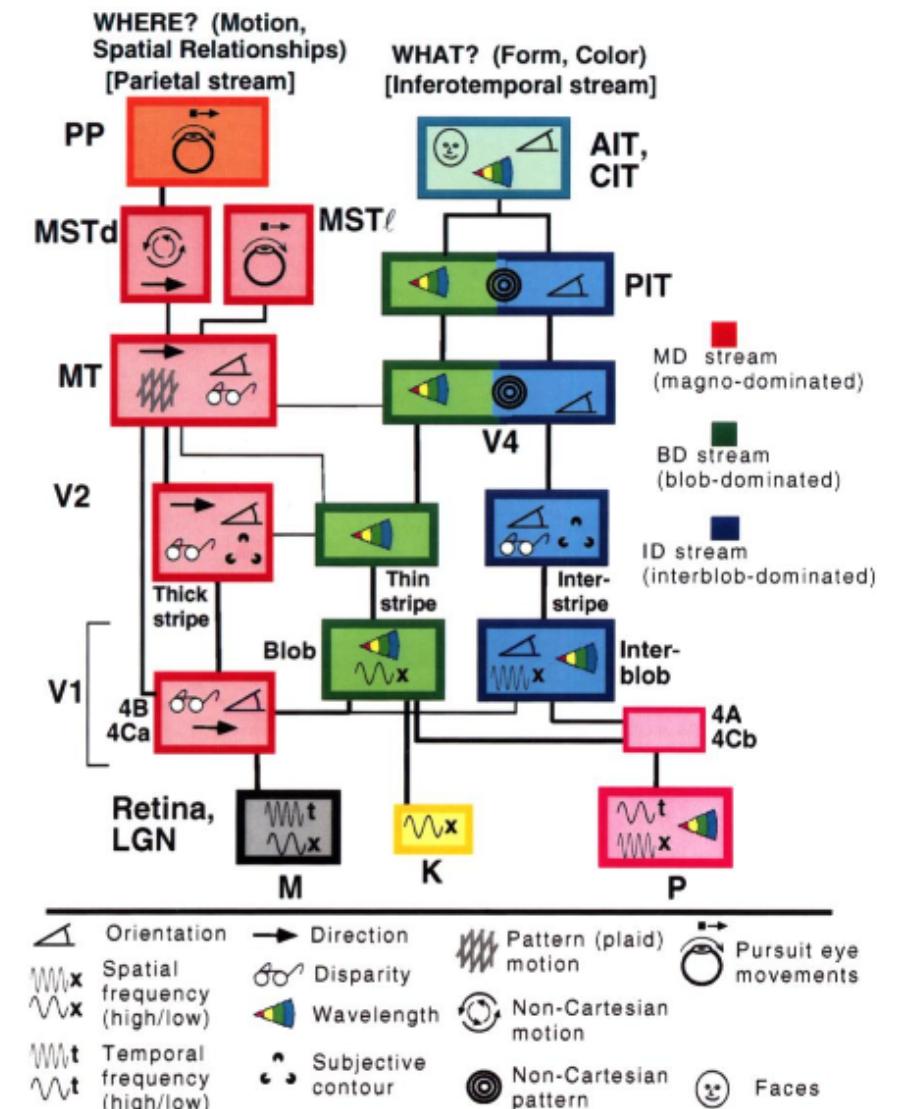




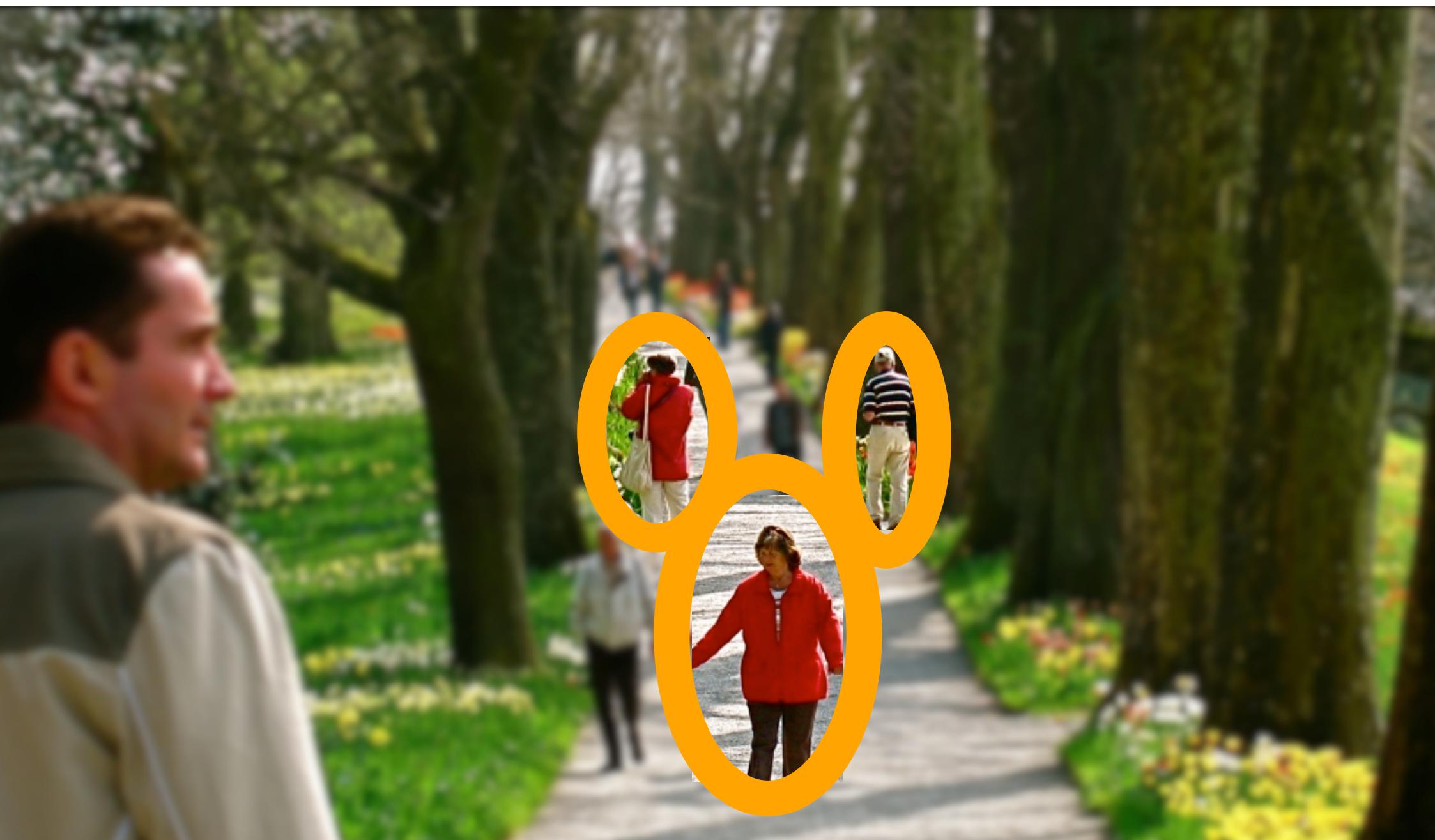
Visual cortex



How are different areas engaged in processing the visual stimuli?

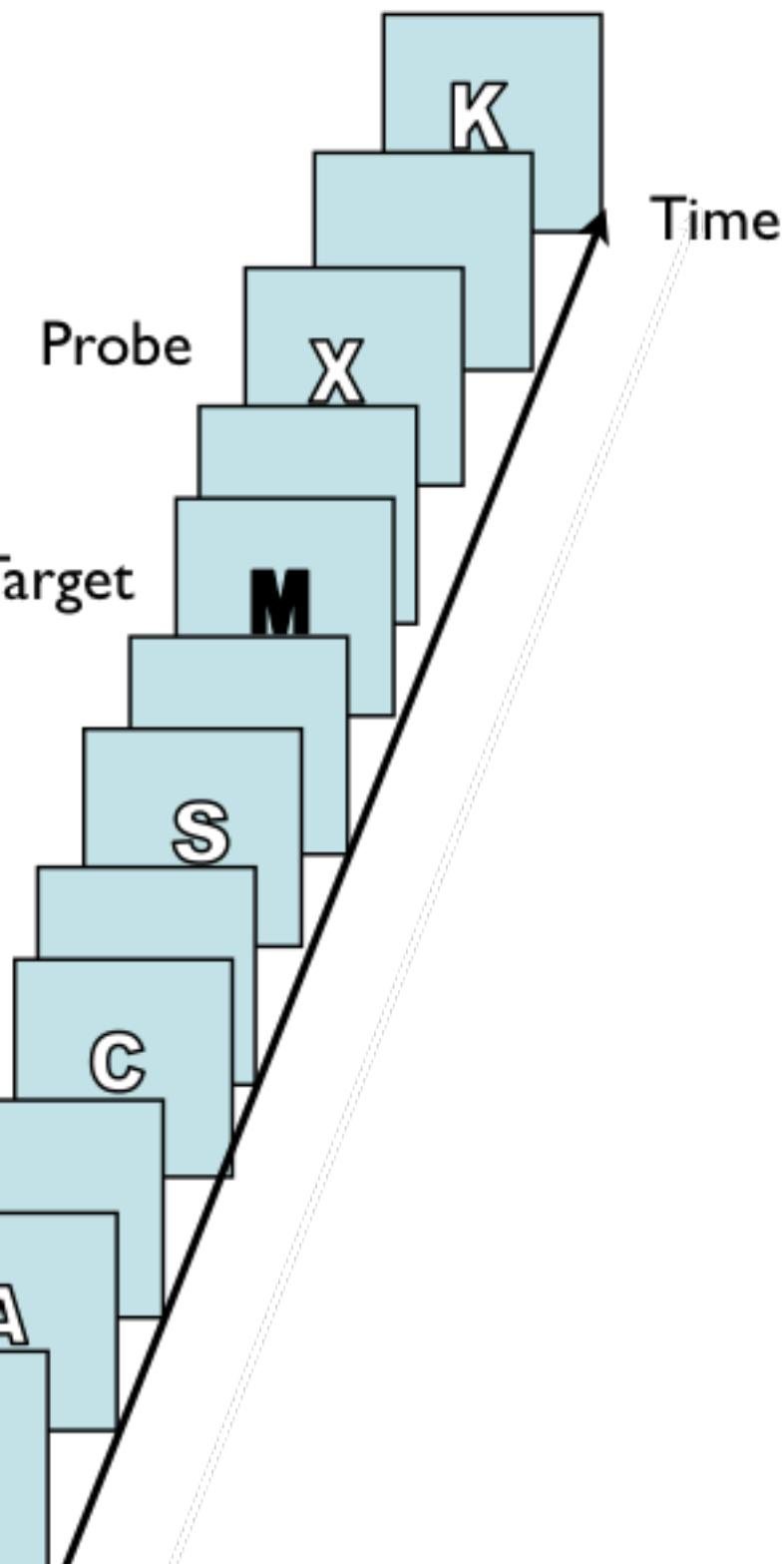
Spatial attention

is the cognitive process of selectively concentrating on one aspect of the environment while ignoring others.



Feature-based attention





Dual Task : main experiment

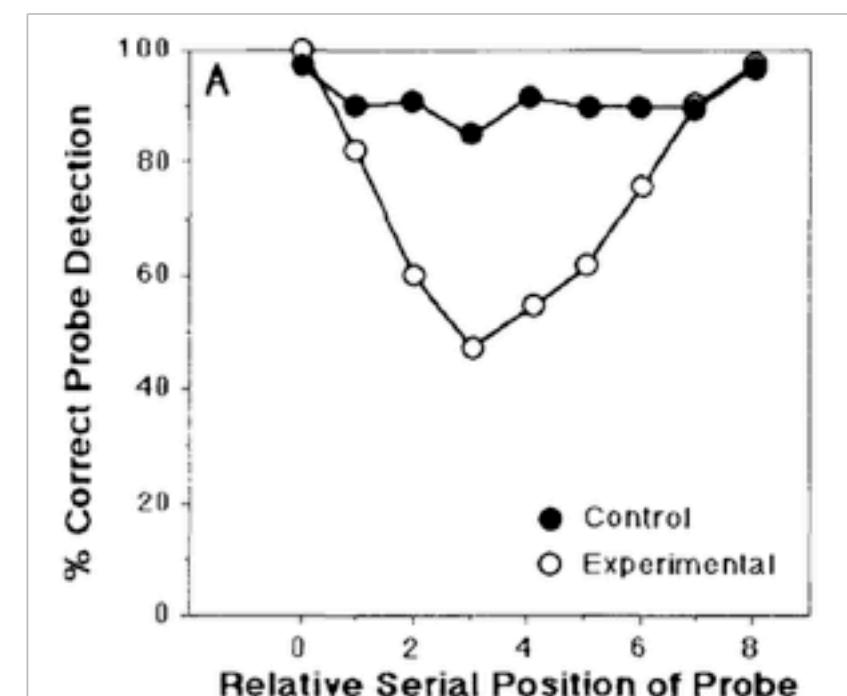
Task 1: Identification of target

Task 2 : Presence or absence of probe('X')

Single Task: Control experiment

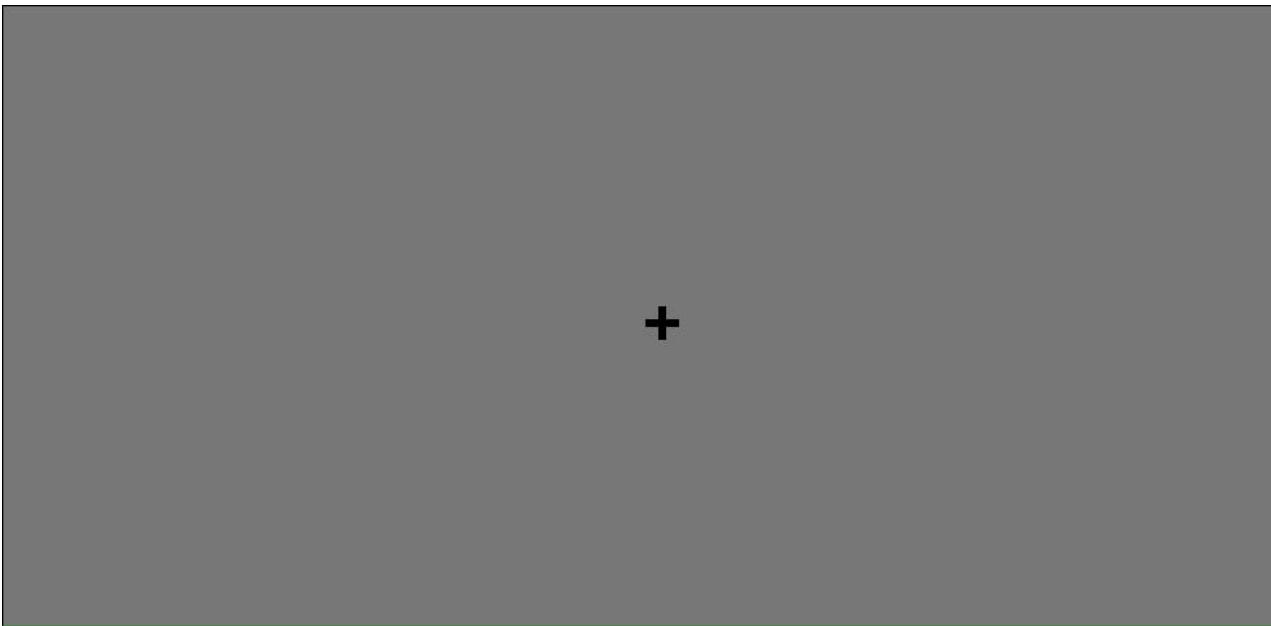
Presence or absence of probe('X')

Result



Temporal Attention

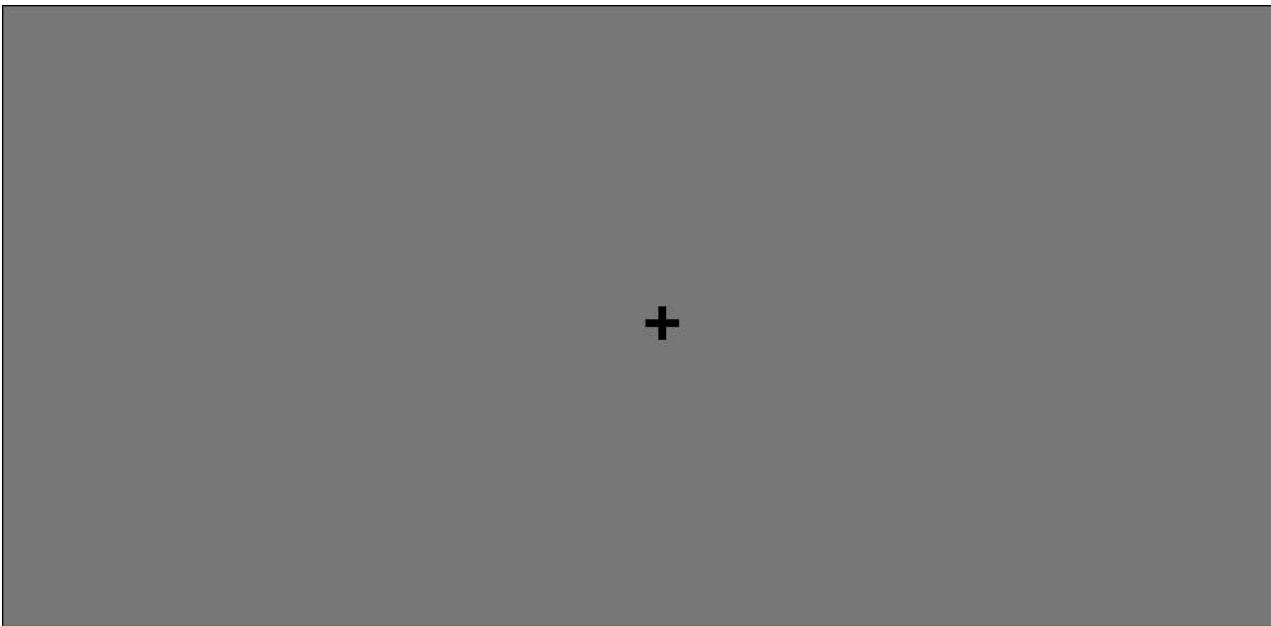
Studied using RSVP (Rapid Serial Visual Presentation) paradigms.



When two targets are presented rapidly among distractors, the processing of the second of the two targets is compromised provided the first target was correctly identified/ processed.

Temporal Attention

Studied using RSVP (Rapid Serial Visual Presentation) paradigms.



Spatial attention is held constant and attention across time is manipulated.

Motion Stimuli

studies have shown than motion stimuli are integrated over space and time (Snowden et al, 1989)

If two similar directions are presented close in time they will be

Hypothesis

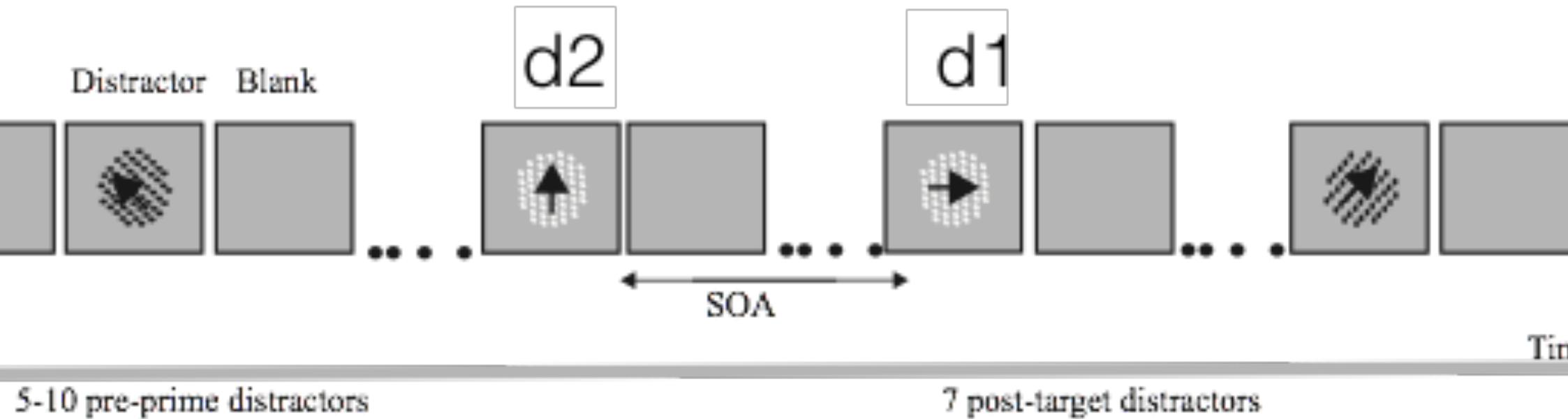
Two directions presented close in time

Same direction

- |
- High signal to noise ratio
- |
- No processing deficit for both stimuli

Different directions

- |
- Low signal to noise ratio
- |
- Processing deficit for one of the stimuli



T1 & T2 directions: Up/Down/Left/Right

Participant response:

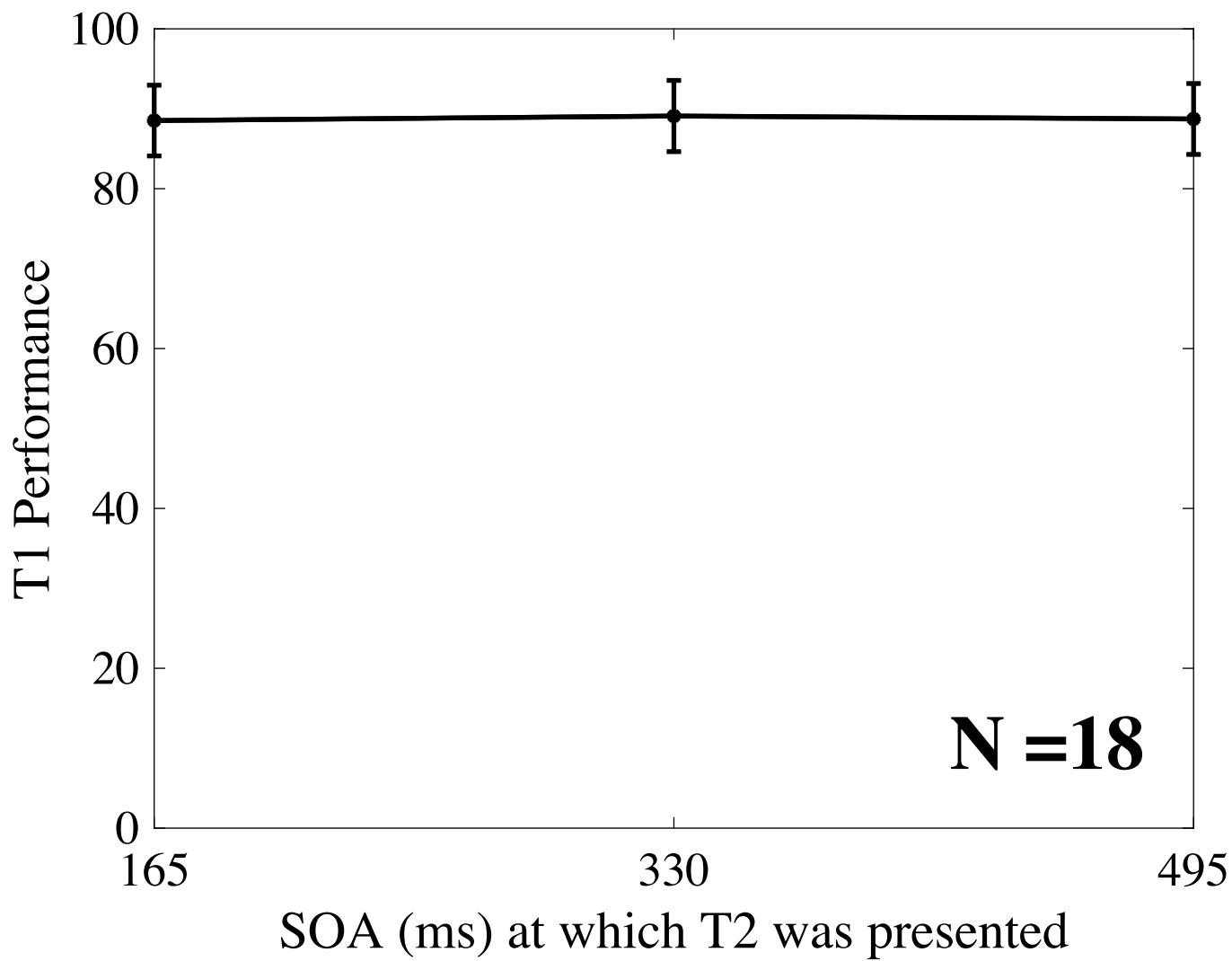
Direction of first white target (Up/Down/Left/Right)

Was there a second white

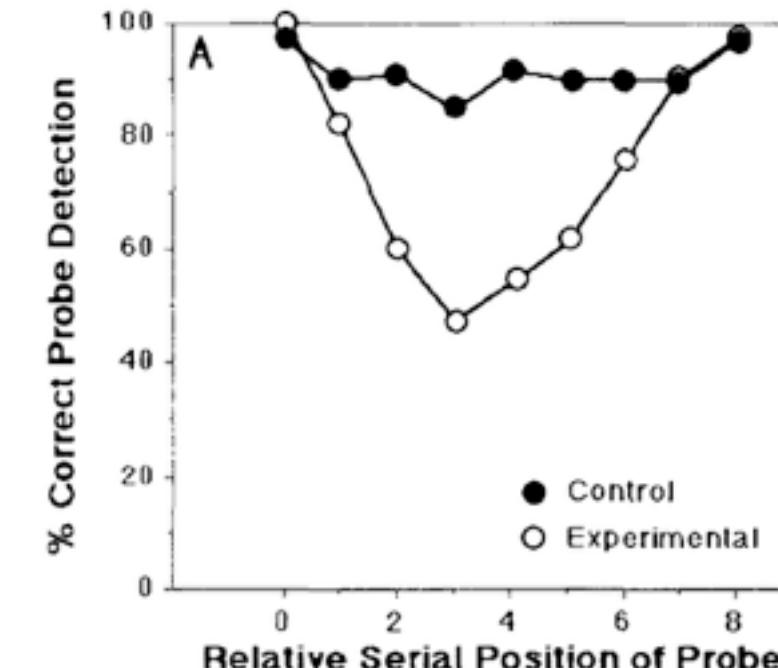
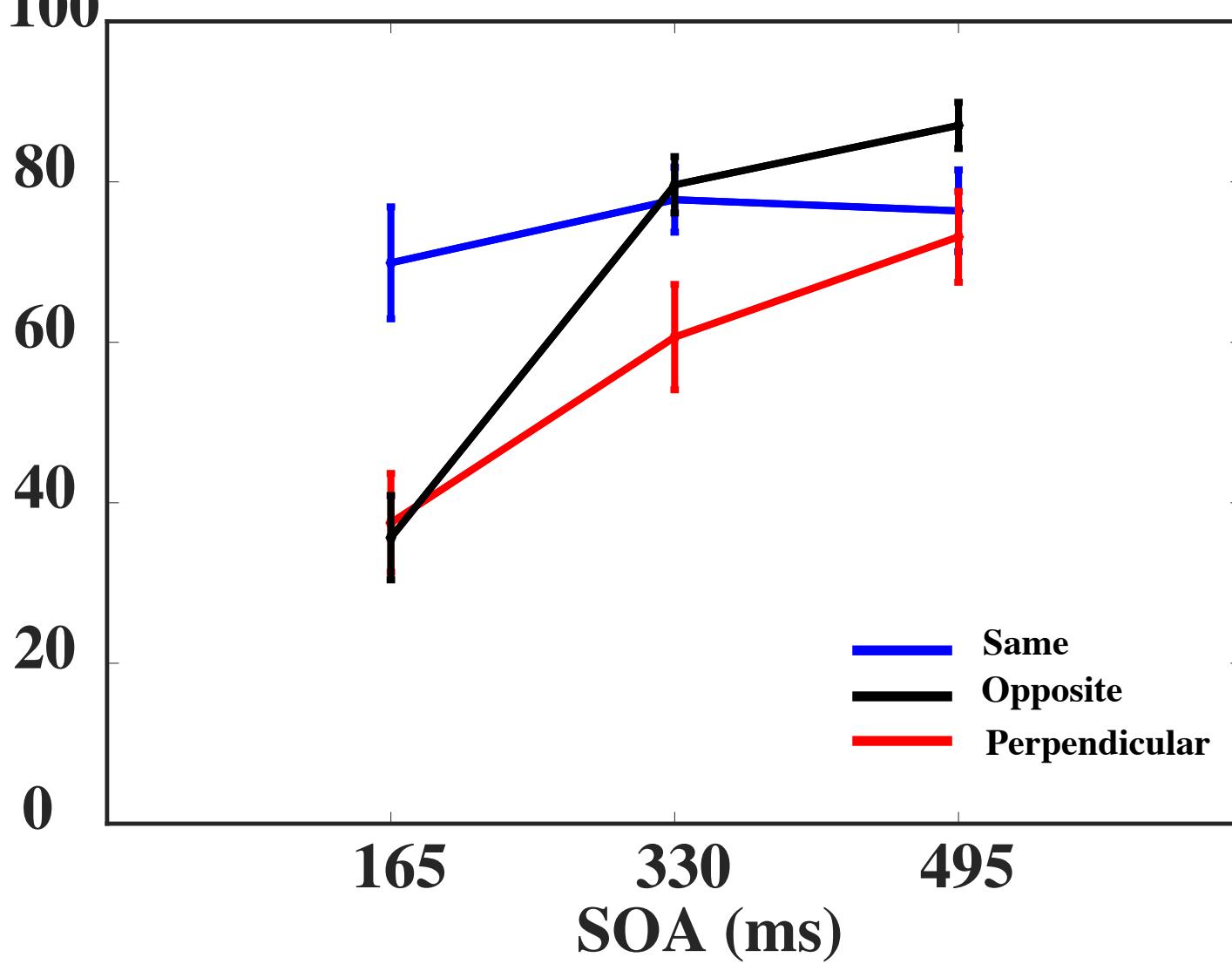
If yes direction of second white w.r.t first white (Same/
Opposite/Perpendicular)

Results: Behavioural data

T1 Performance



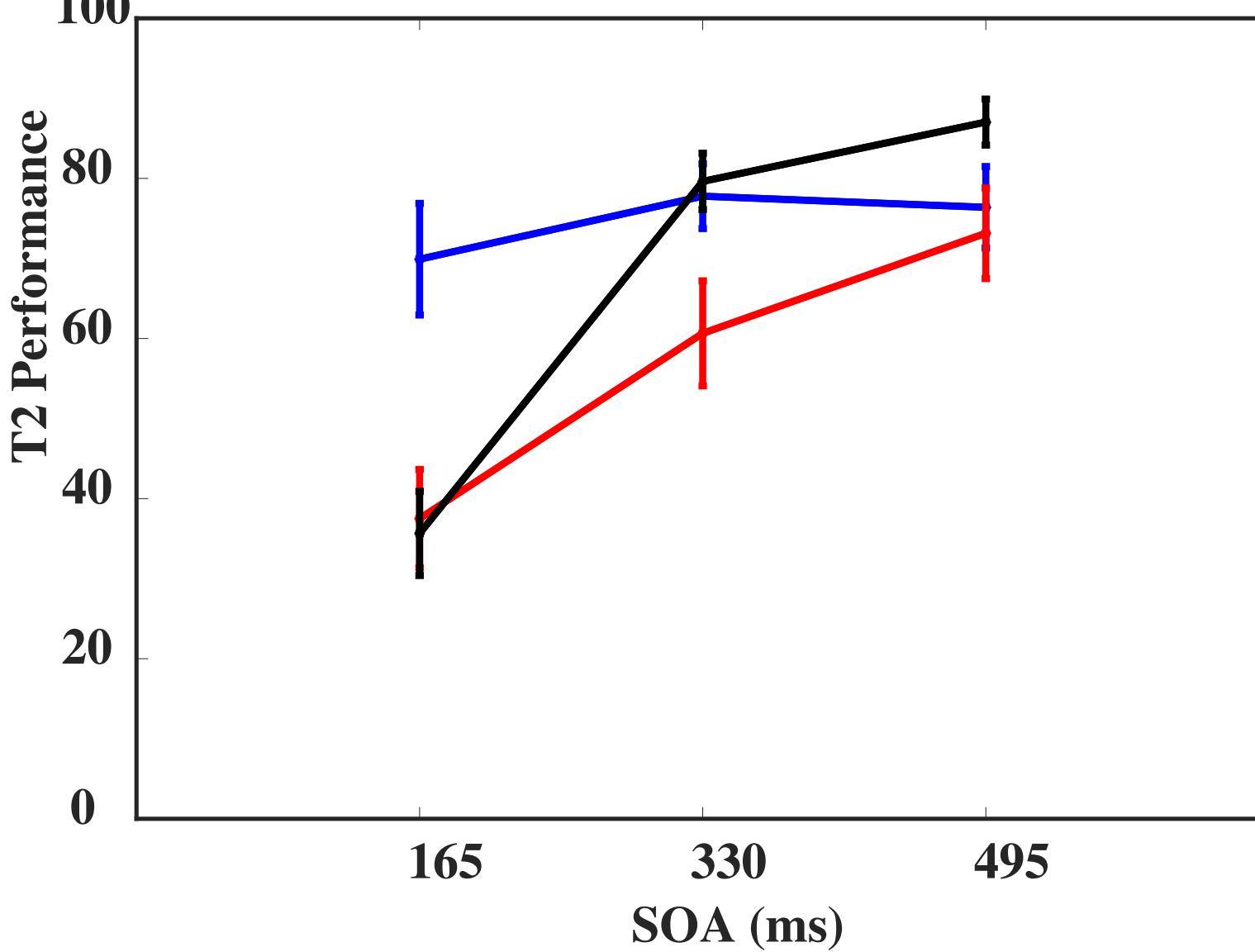
No deficit in T1 processing



Raymond et al. 1982
N = 18

Two way RM ANOVA: SOA and direction factors

1. Significant main effects of SOA and direction
2. Significant interaction effects

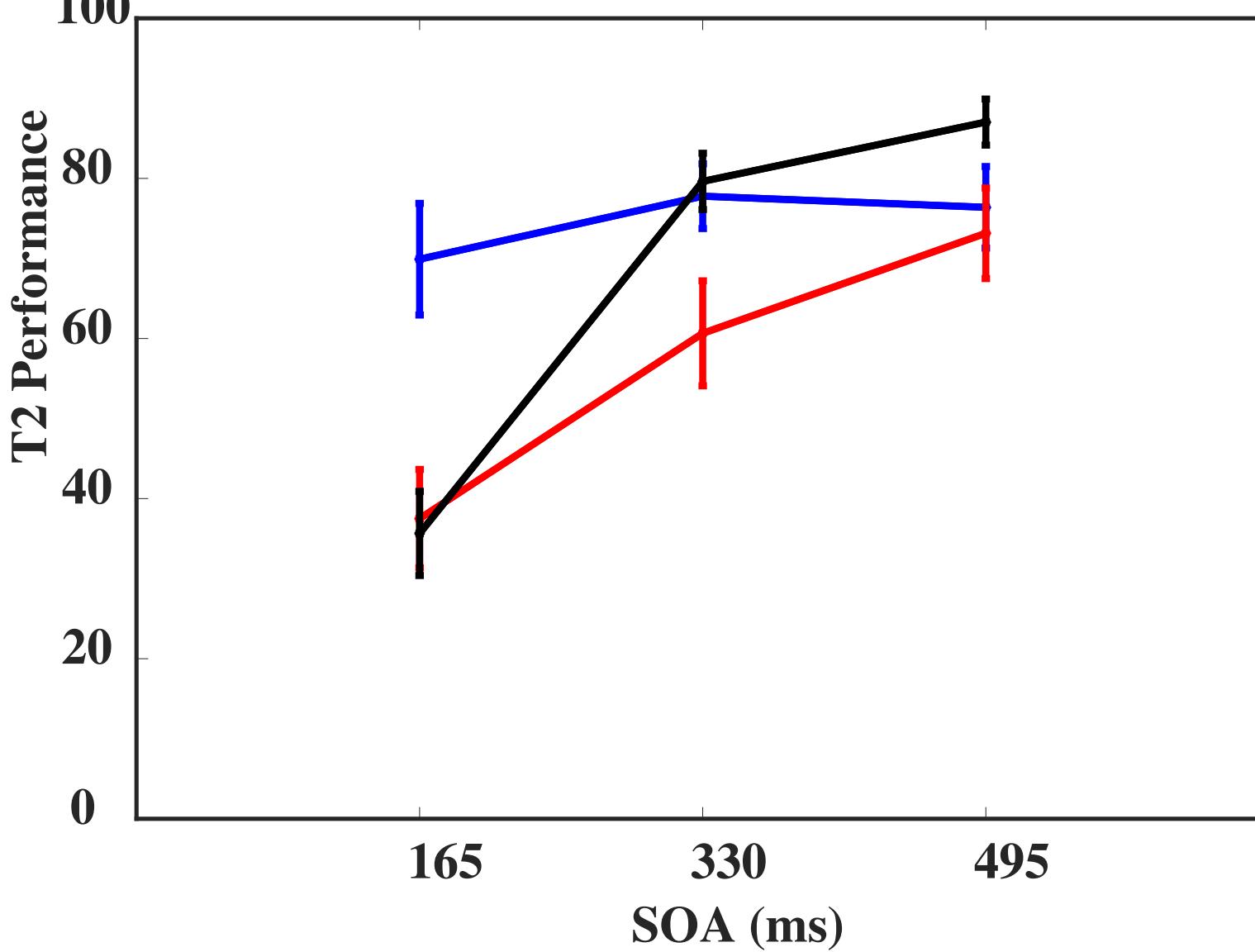


N = 18

Two way RM ANOVA: SOA and direction factors

No significant difference across SOA for same condition.

Performance @SOA1 significantly less than SOA 2 & 3 for



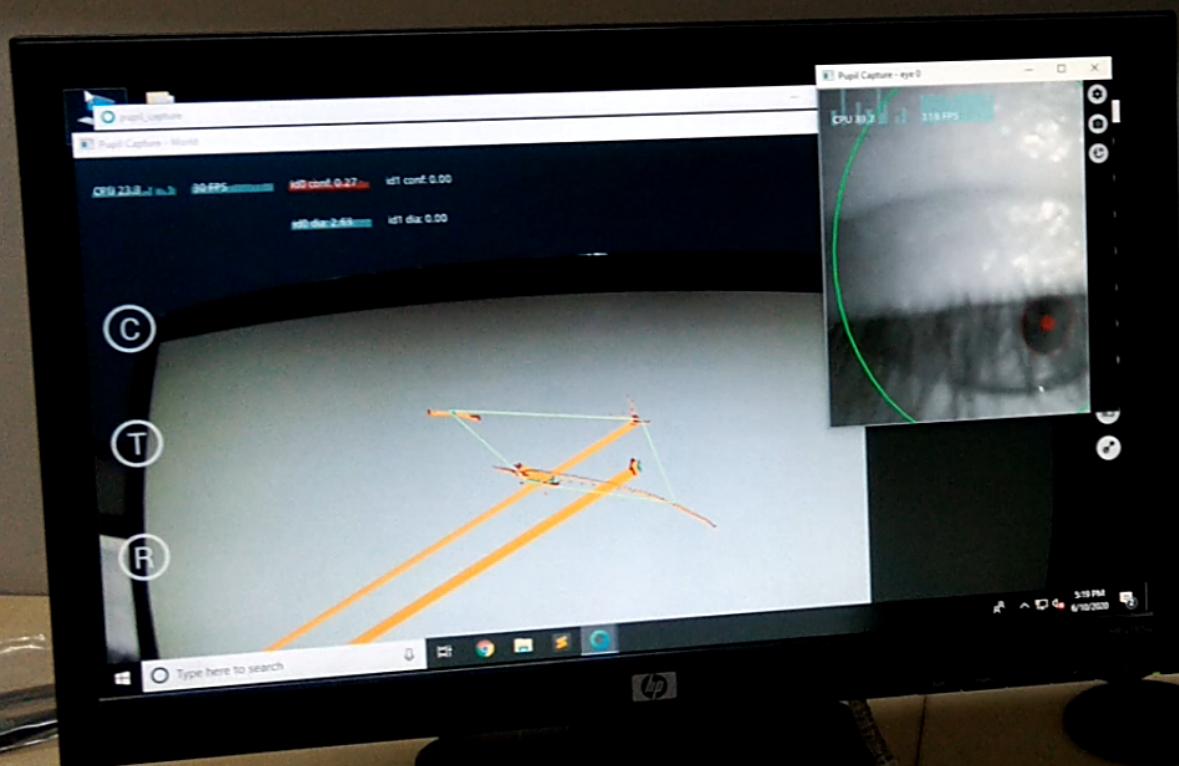
N = 18

In agreement to our hypothesis: No T2 processing deficit when the two targets were in same direction.

Pupil Analysis

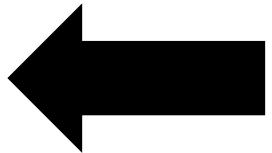


<https://stuartcrossman.wordpress.com/2013/01/>



Eye tracker Data

Fixation locations



Eye tracker

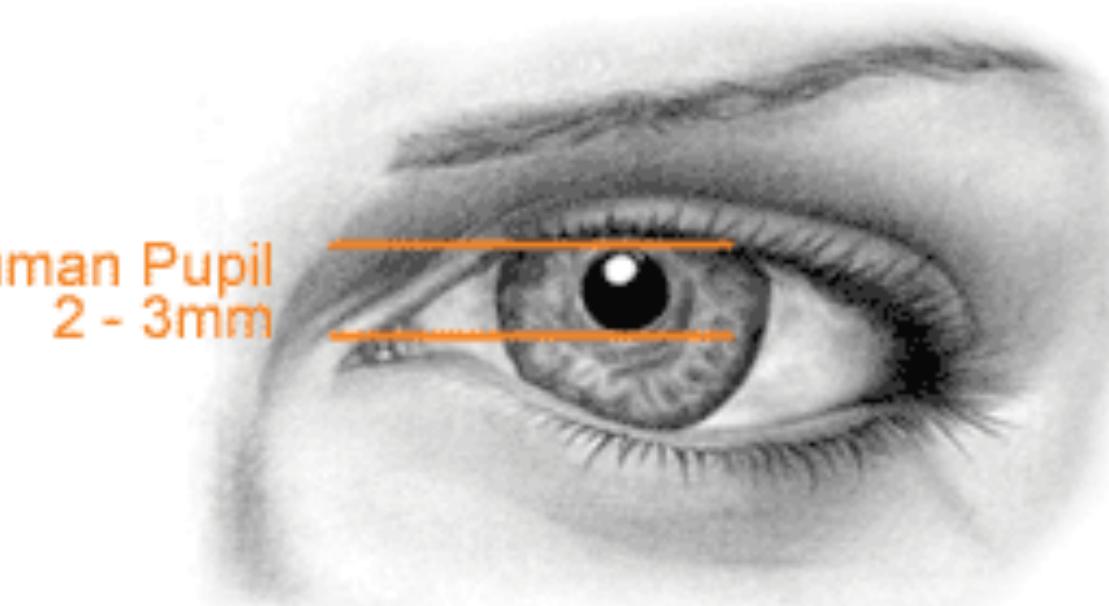


Pupil diameter

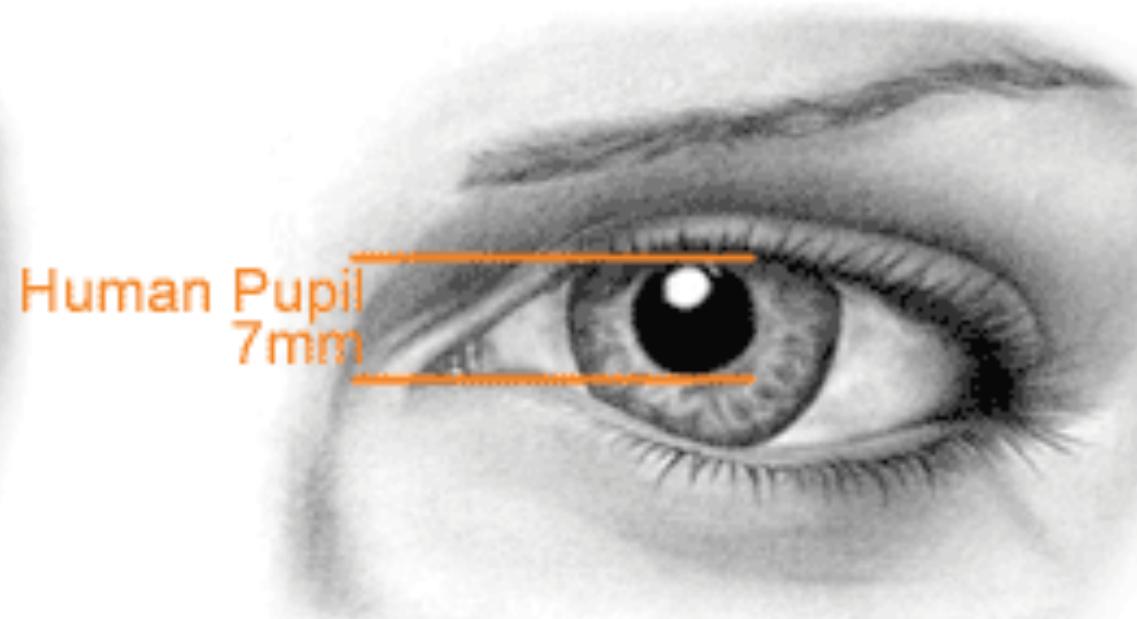


Relationship of eye fixation and dynamics of pupil diameter with

Pupillary Response



Bright Conditions

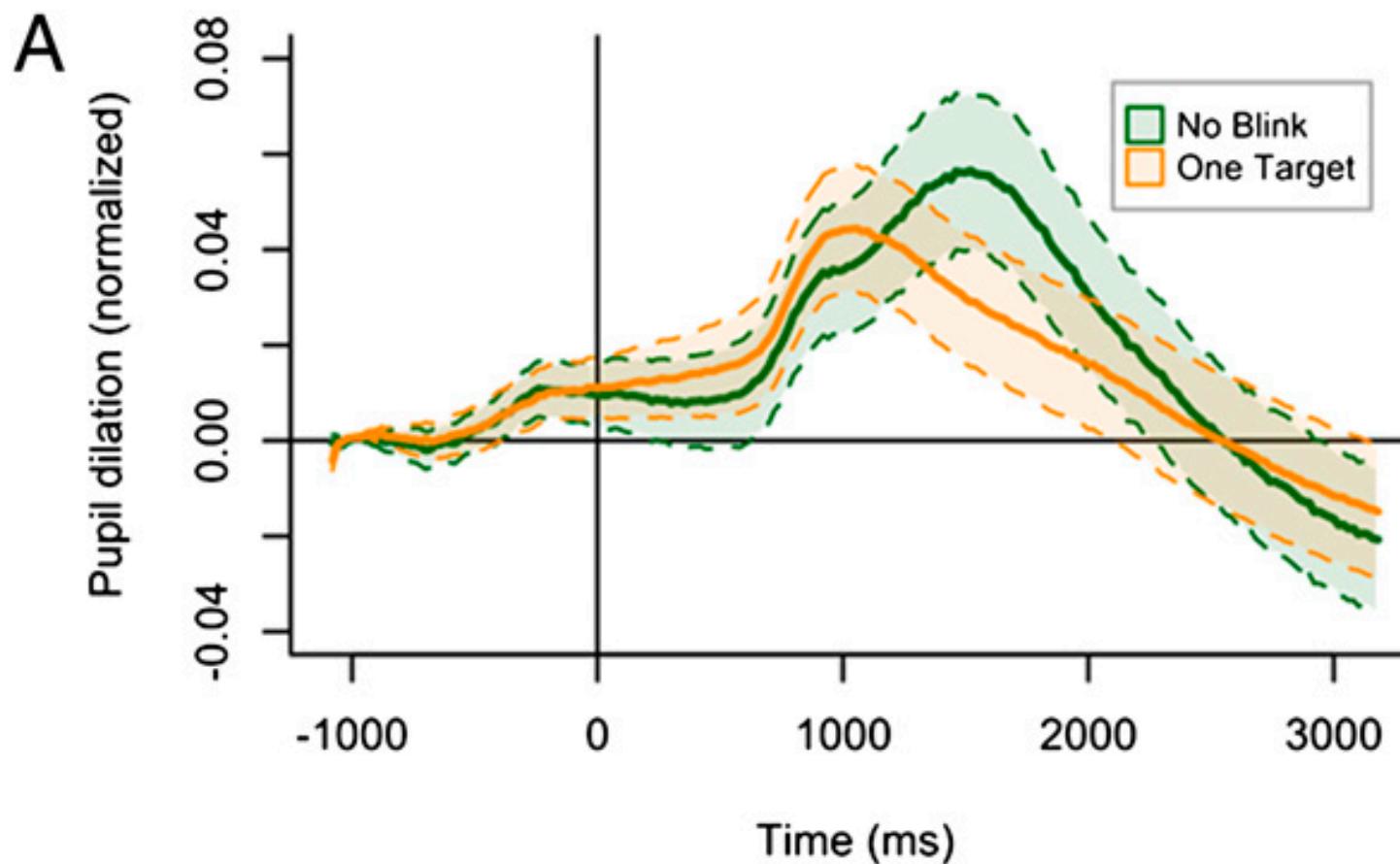


Low Light Conditions

<https://www.bestbinocularsreviews.com/blog/exit-pupil-06/>

attention at high temporal resolution

Stefan M. Wierda^{a,b,1}, Hedderik van Rijn^c, Niels A. Taatgen^d, and Sander Martens^{a,b}



Plots

Only correct trials

Same : NoT2 Vs SOA 1, SOA 2, SOA3

Opposite: NoT2 Vs SOA 1, SOA 2, SOA3

Perpendicular: NoT2 Vs SOA 1, SOA 2, SOA3

Time points: -1000ms T1 Onset to 500ms points
more than T2 onset.

26.06.2020

$a = [5 \ 4 \ 5 \ 6 \ 8]$

$b = [10 \ 15 \ 12 \ 16 \ 12]$

Mean = $(a + b)/2 = [7.5 \ 9.5 \ 8.5 \ 11 \ 10]$

$c = [25 \ 44 \ 50 \ 56 \ 18]$

Mean = $(a + b + c)/3 = [13.22 \ 21 \ 22.33 \ 26 \ 12]$

= [5 4 5 6 8]

max(a)) = [0.6250 0.5000 0.6250 0.7500 1.000]

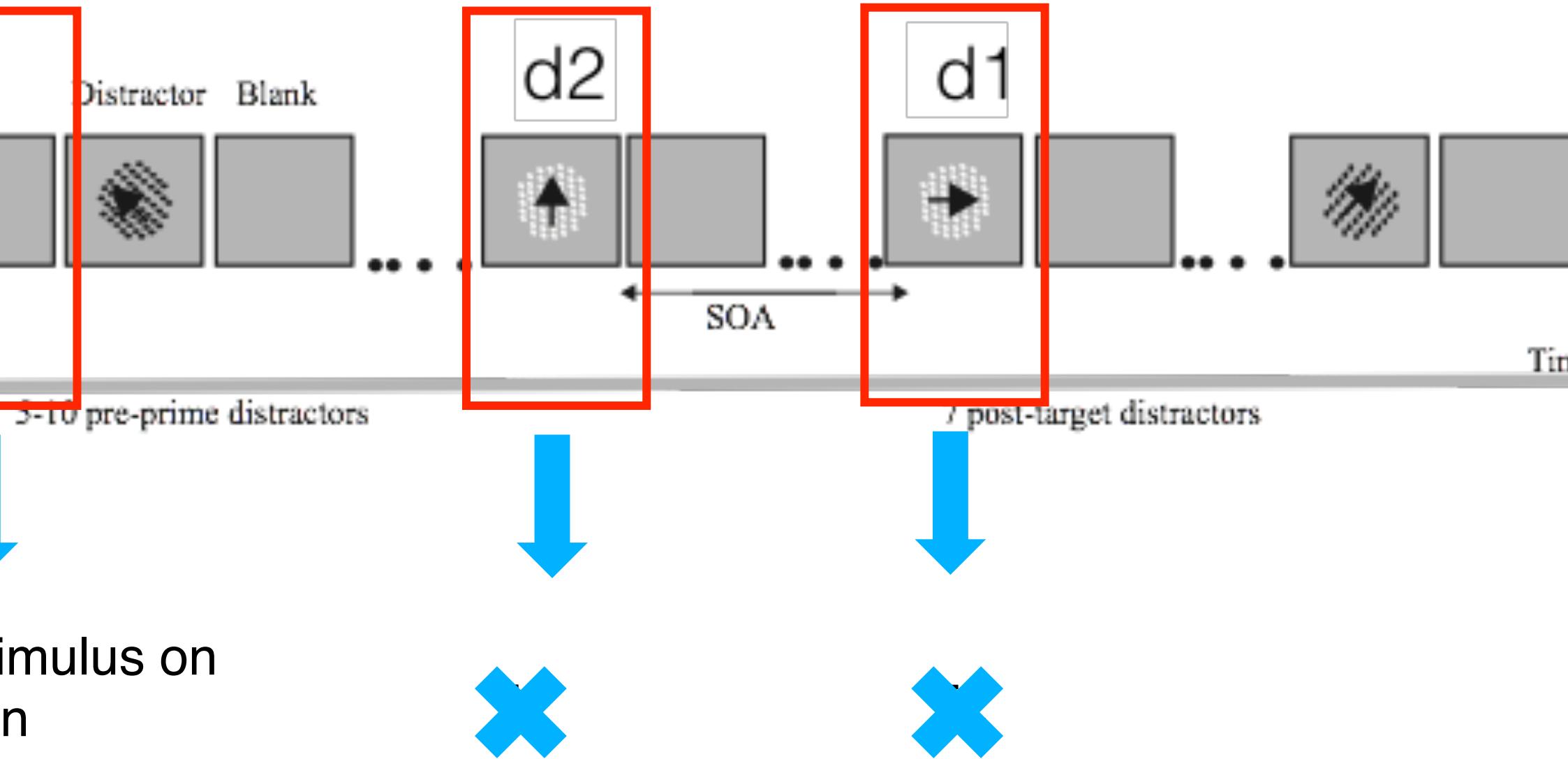
= [10 15 12 16 12]

max(b)) = [0.6250 0.9375 0.7500 1.0000 0.7500]

= [25 44 50 56 18]

max(c)) = [0.4464 0.7857 0.8929 1.0000 0.3214]

mean = (a + b + c)/3 = [0.5655 0.7411 0.7560 0.9167 0.690]



Normalization w.r.t to fixation poi

Normalization with Fixation point

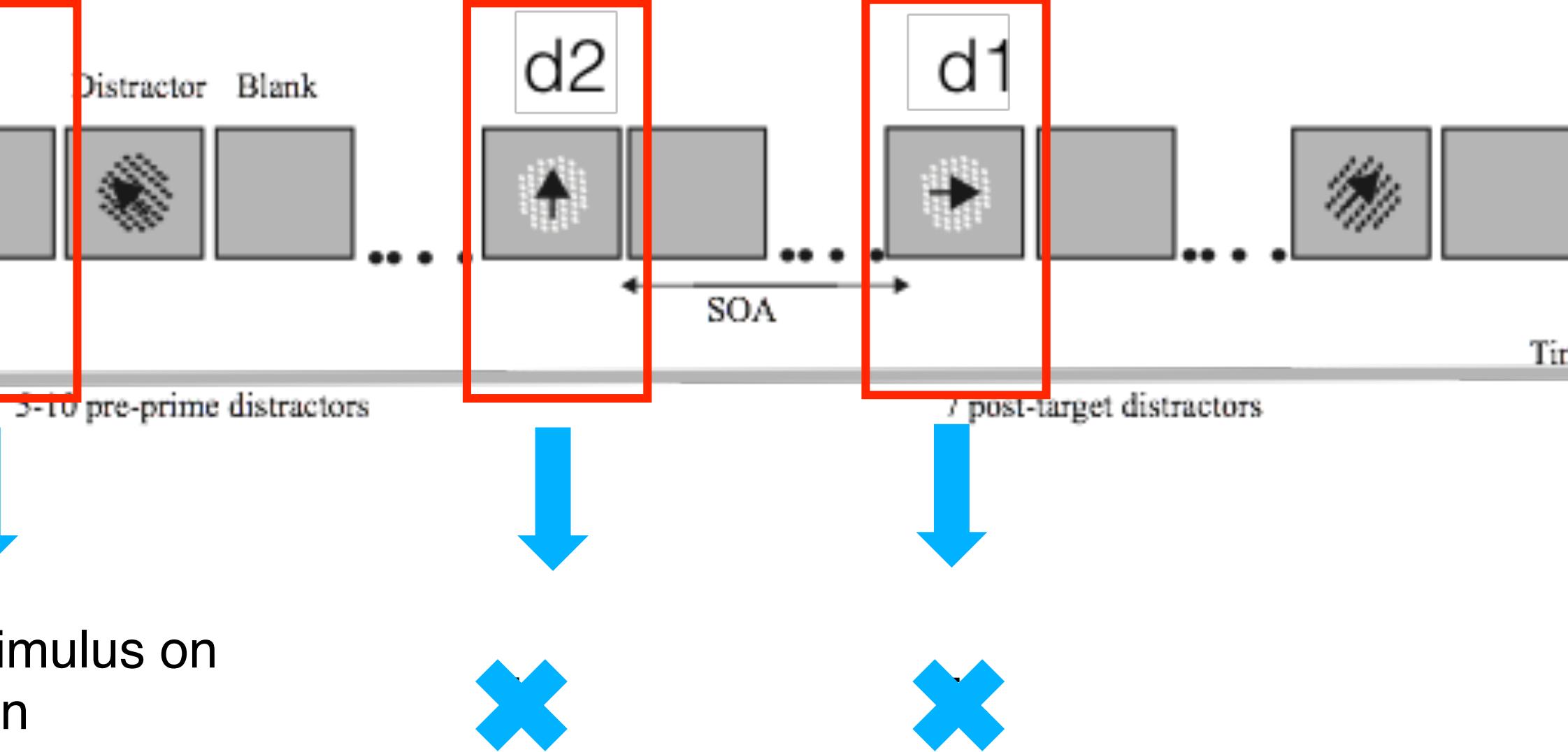
Fixation Point = ParticipantData{i}.DataEvents{i}.EP.PD(1 : 250)

Sampling rate: Eye tracker : 1250Hz

1 second = 1250 times samples

1 sample= $1/1250 = 0.0008$ second = 0.8ms

ms



Normalization w.r.t to fixation poi