Investigating perceptual completion in a real-world experiment

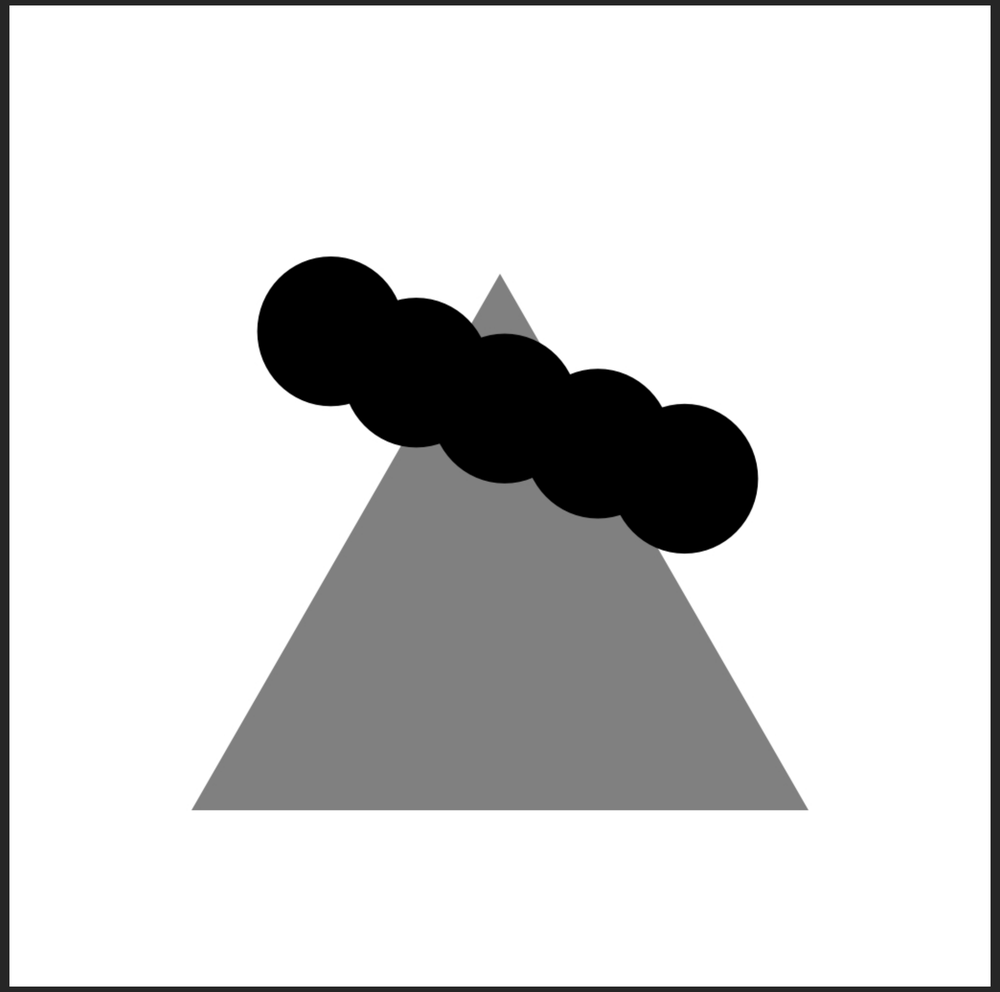
A bachelor thesis project

Christian Haase

Supervisor Guillermo Aguillar

Perceptual Completion

Perceptual Completion



Occlusion Illusion

Perceptual Completion

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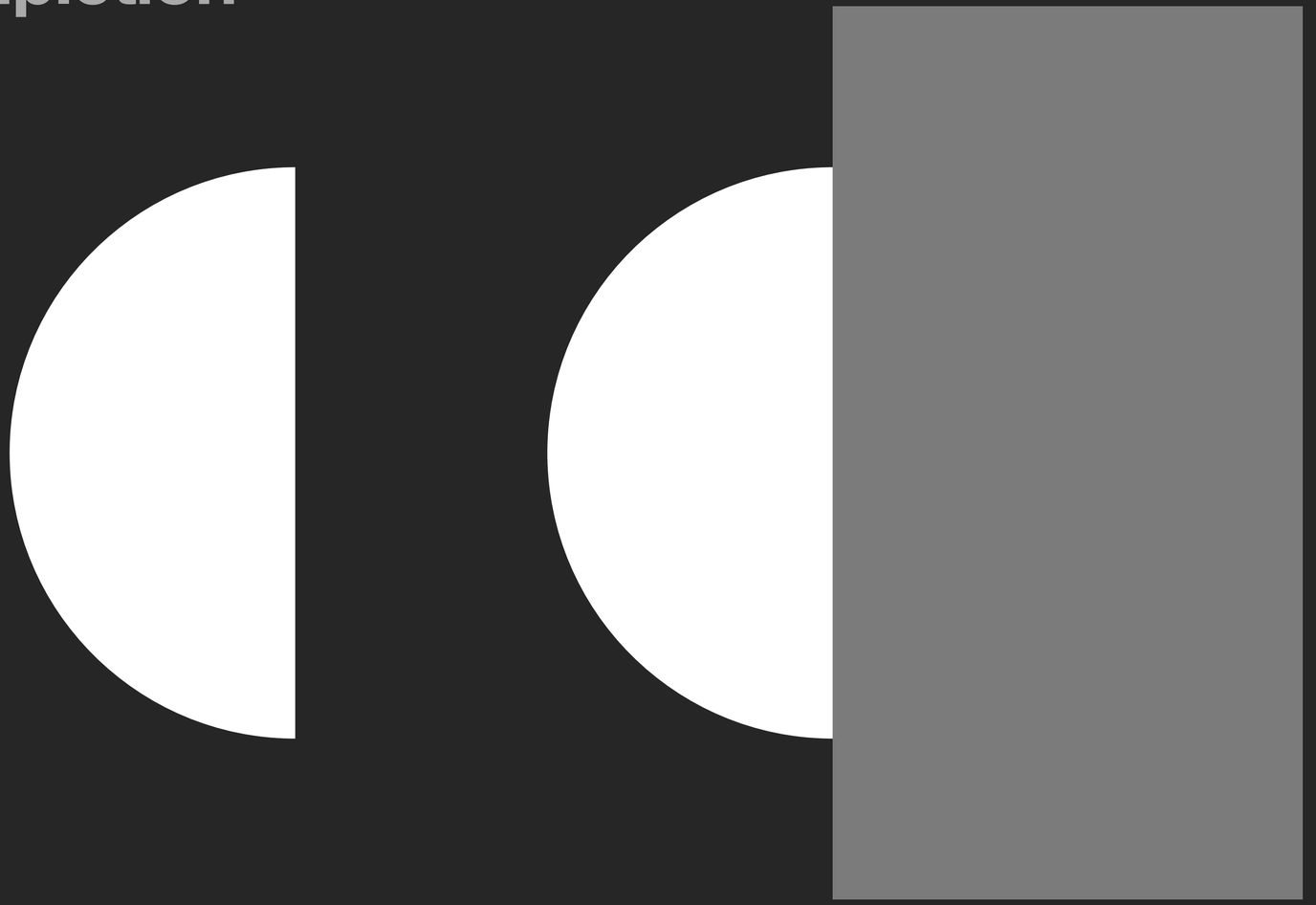

Scherzer et al. (2015)

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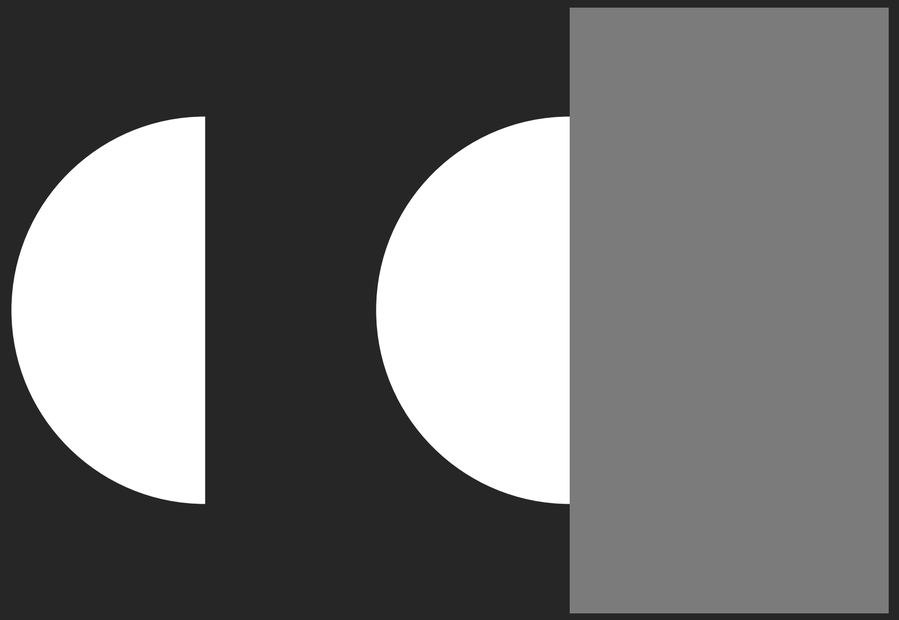

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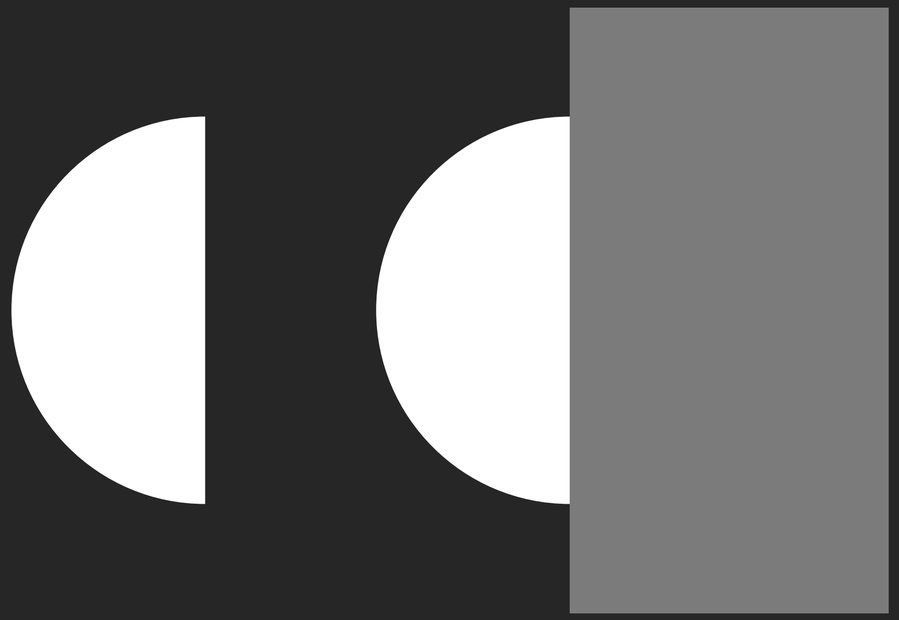
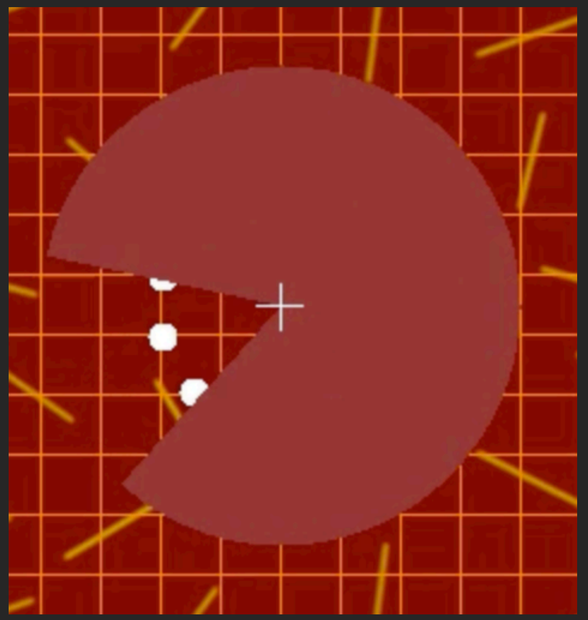
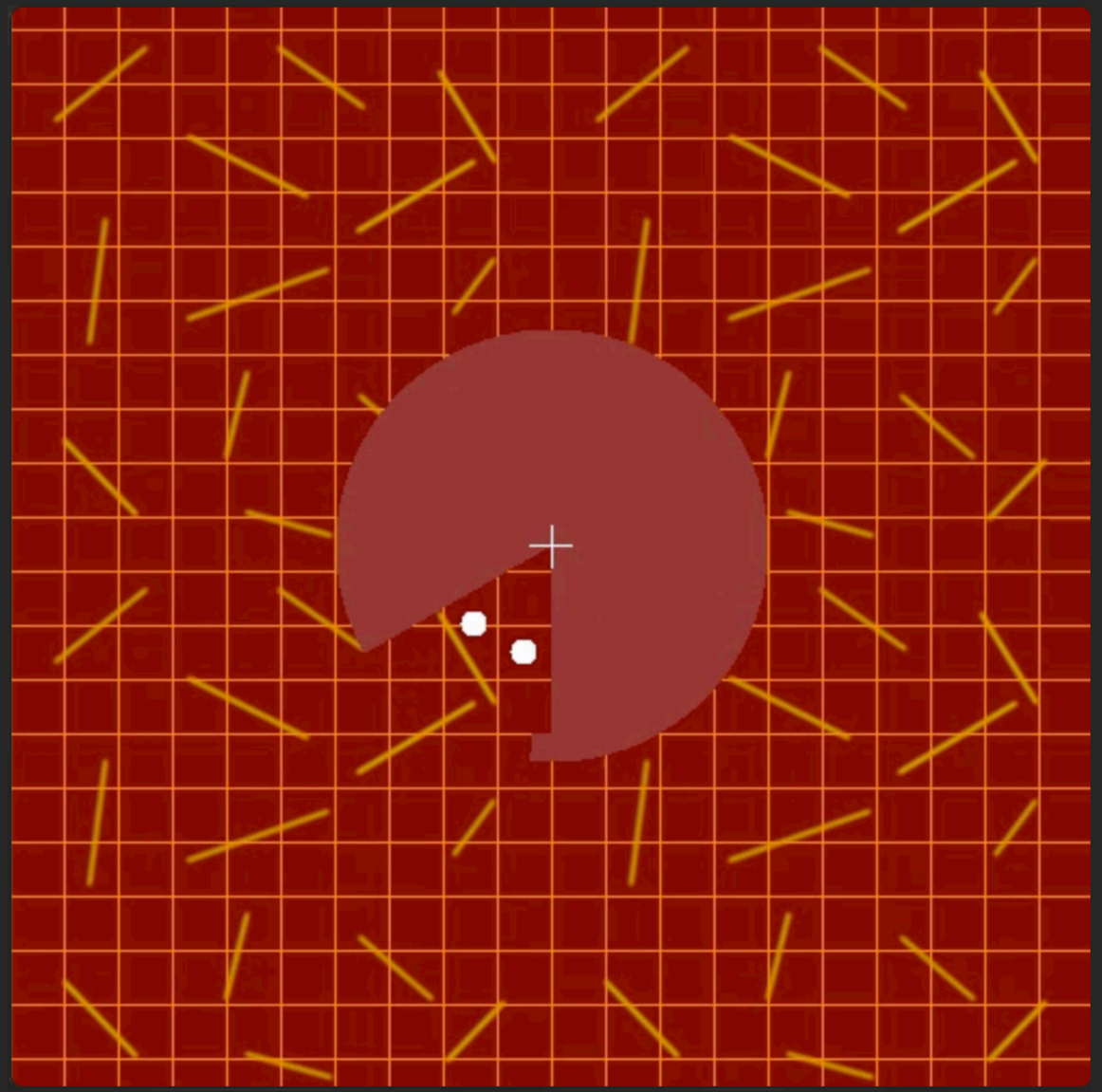




Experiment

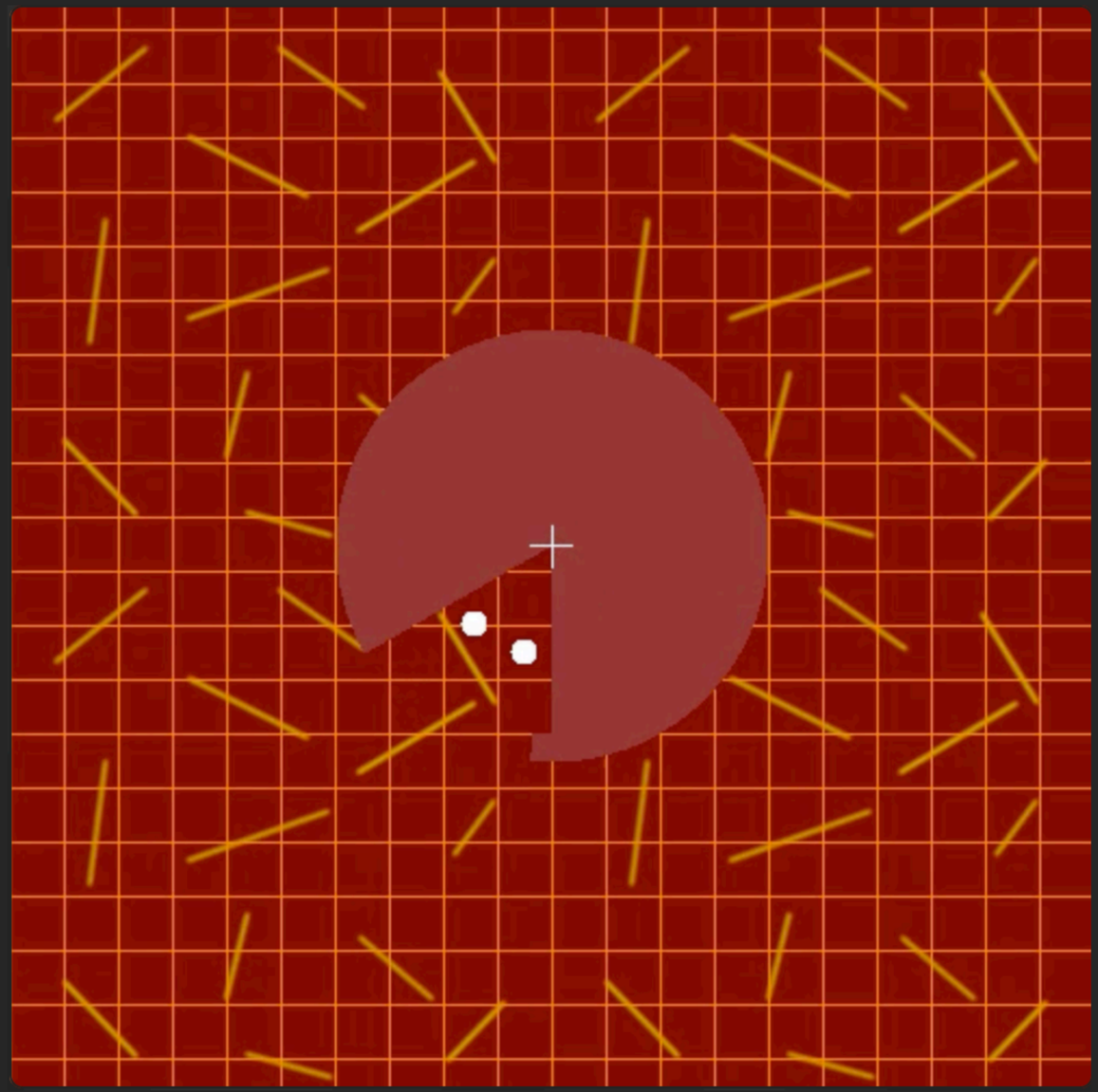
Scherzer et al. (2015)



Experiment

Scherzer et al. (2015)

1. Fixate on the white cross in the center
2. Count the white dots you can see at once (in every frame)



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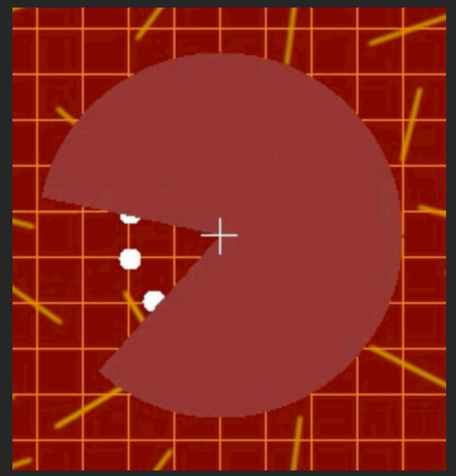

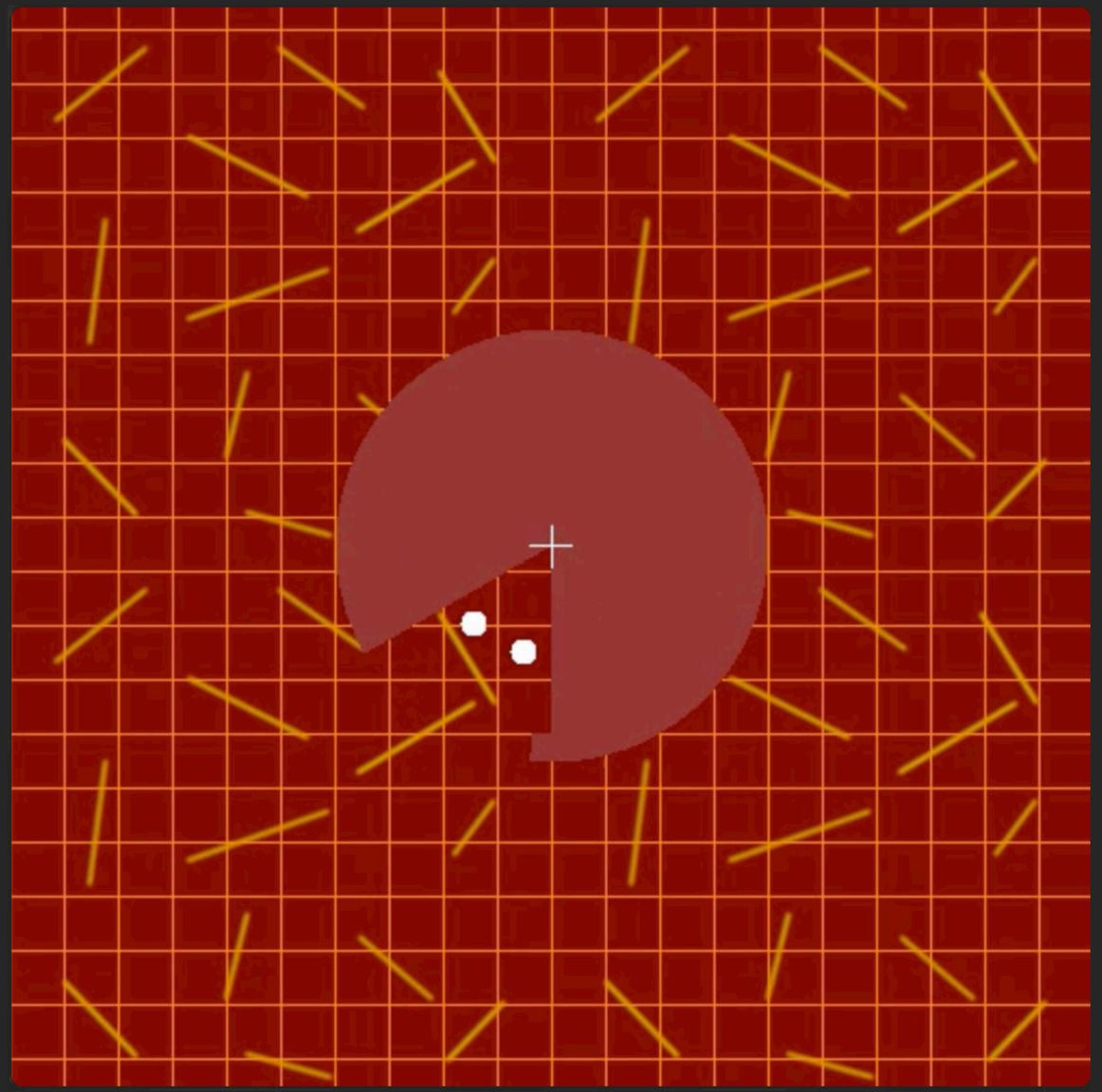

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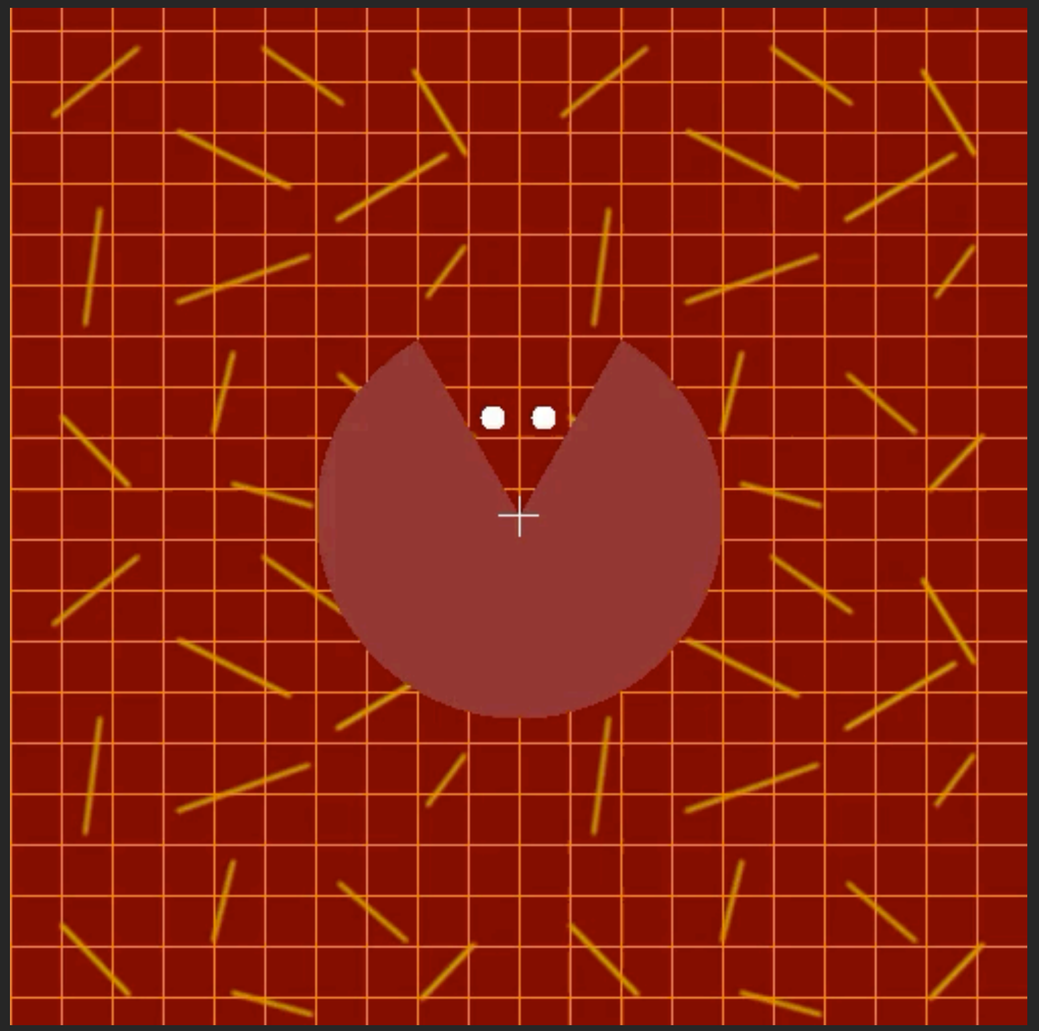
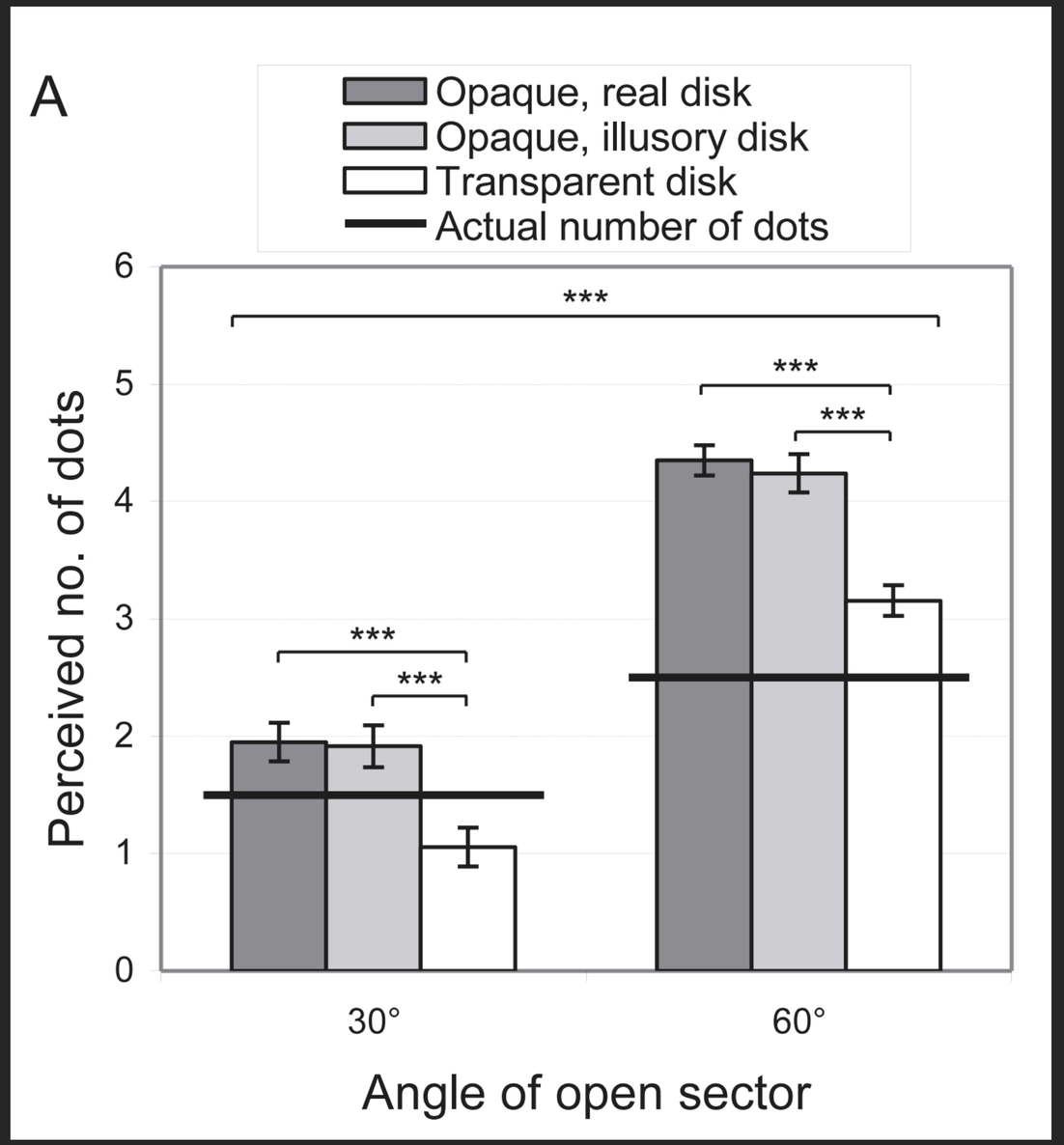


Experiment Results

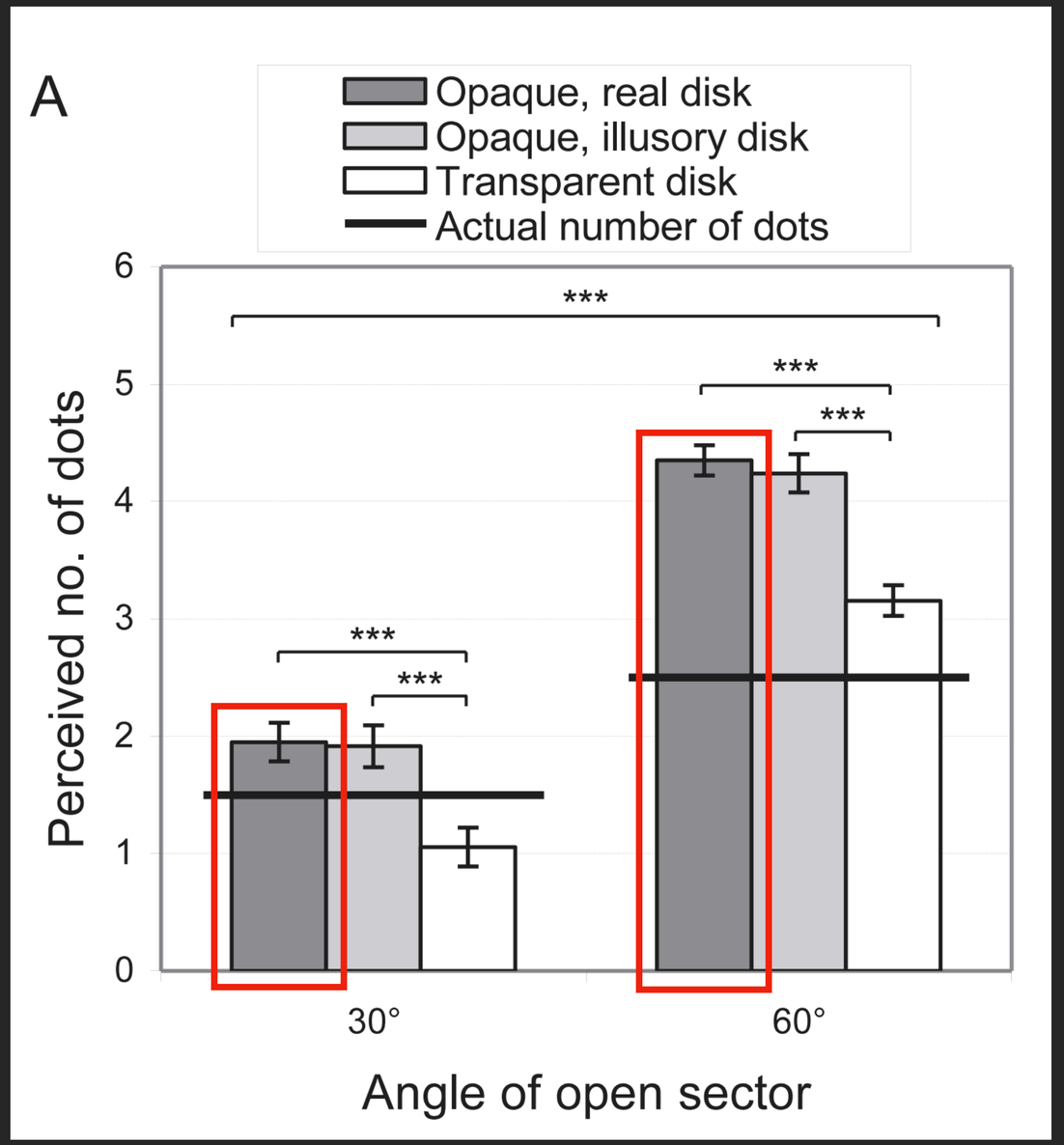
Scherzer et al. (2015)



Experiment Results

Scherzer et al. (2015)

1. "High contrast" Occluder with the highest magnitude of effect.



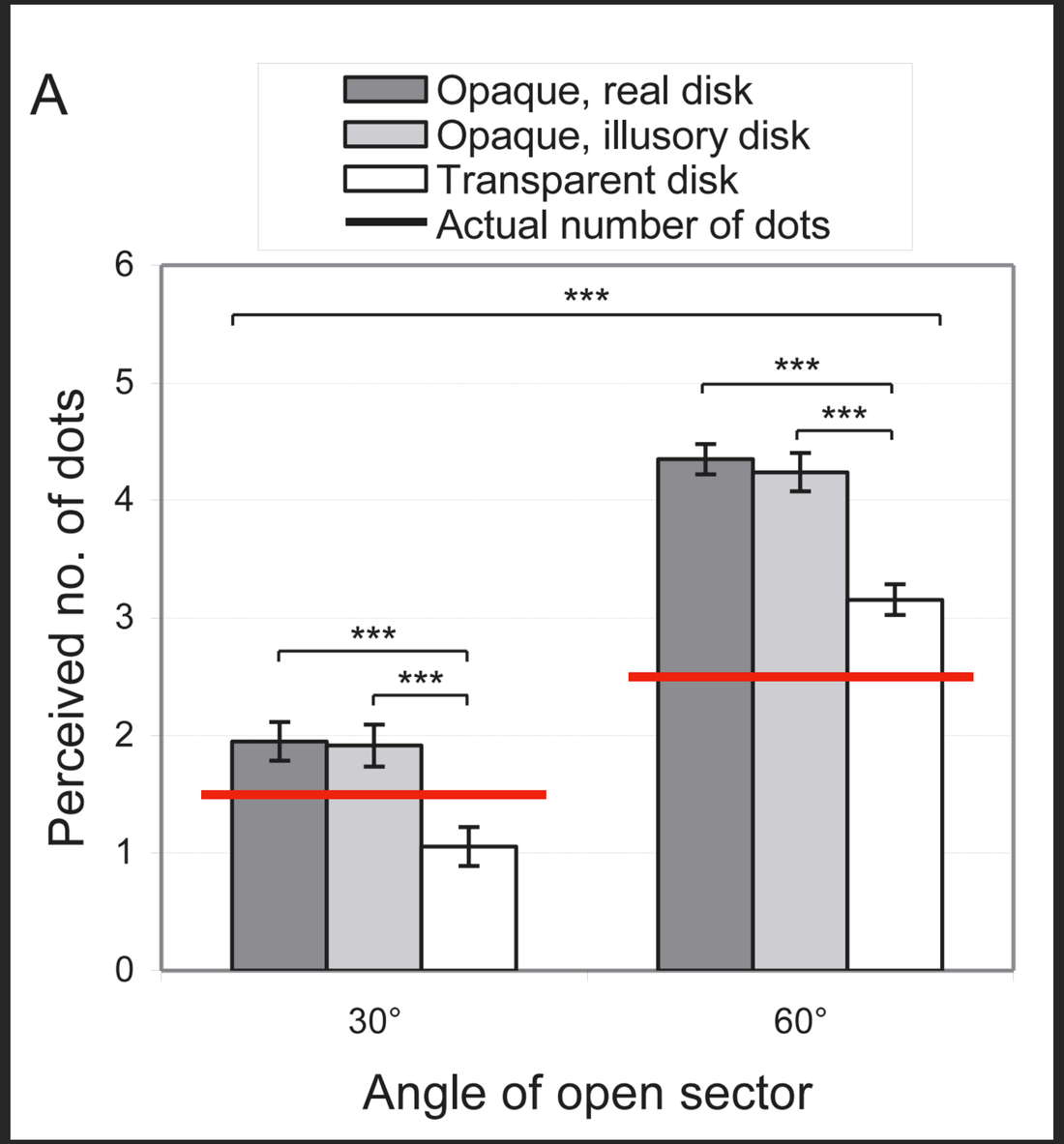
Experiment Results

Scherzer et al. (2015)

1. "High contrast" Occluder with the highest magnitude of effect.

2.

Angle of oben sector	30°	60°
Actual no. of dots	1-2	2-3
Perceived no. of dots	~ 2	~ 4.5



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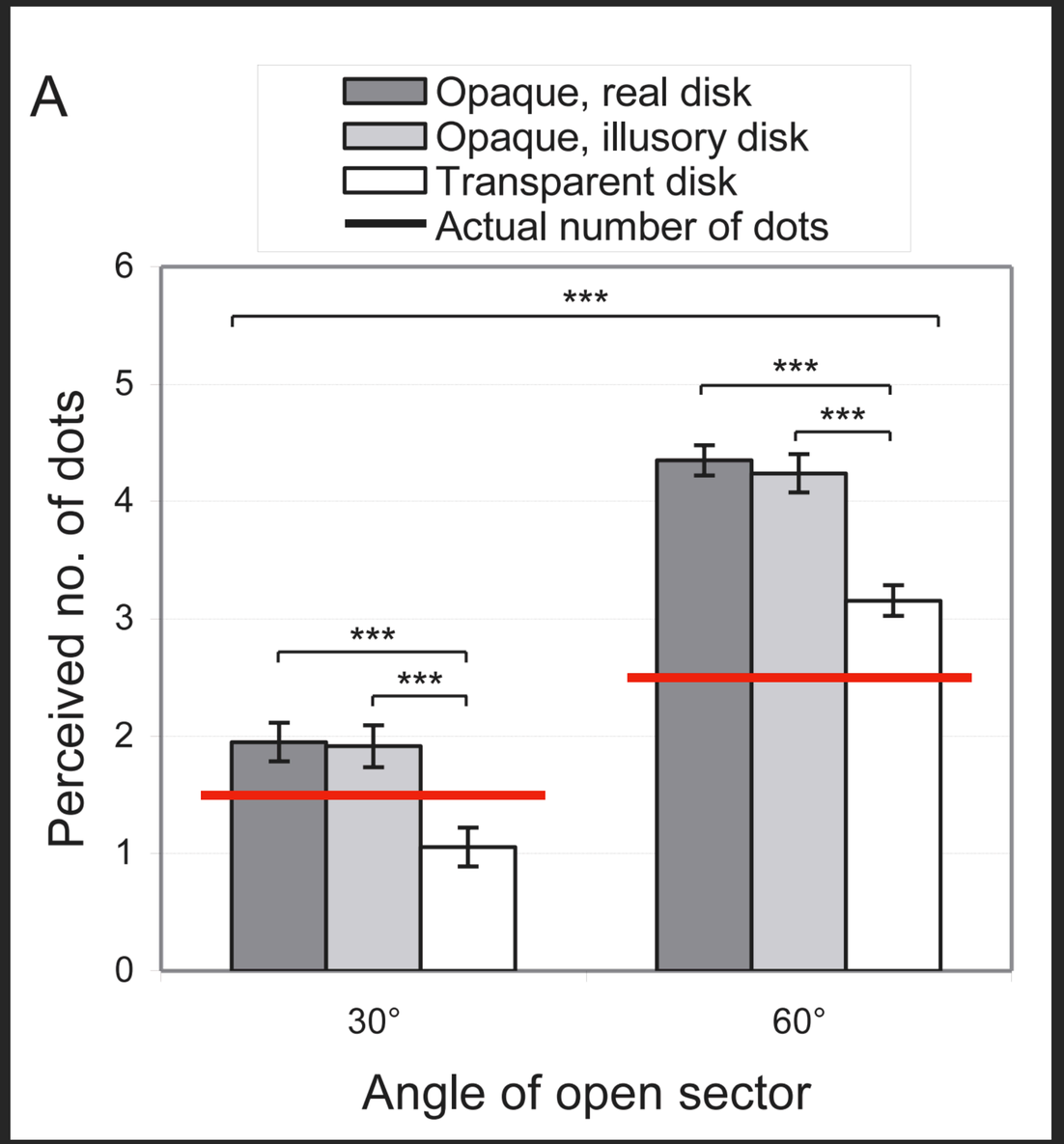
In a real-world experiment?



Research Question

Thesis Work

How does perceptual completion under occlusion differ between digitally presented stimuli on a monitor vs. physically presented stimuli in a real-world experiment?

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Apparatus

Thesis Work

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Own design

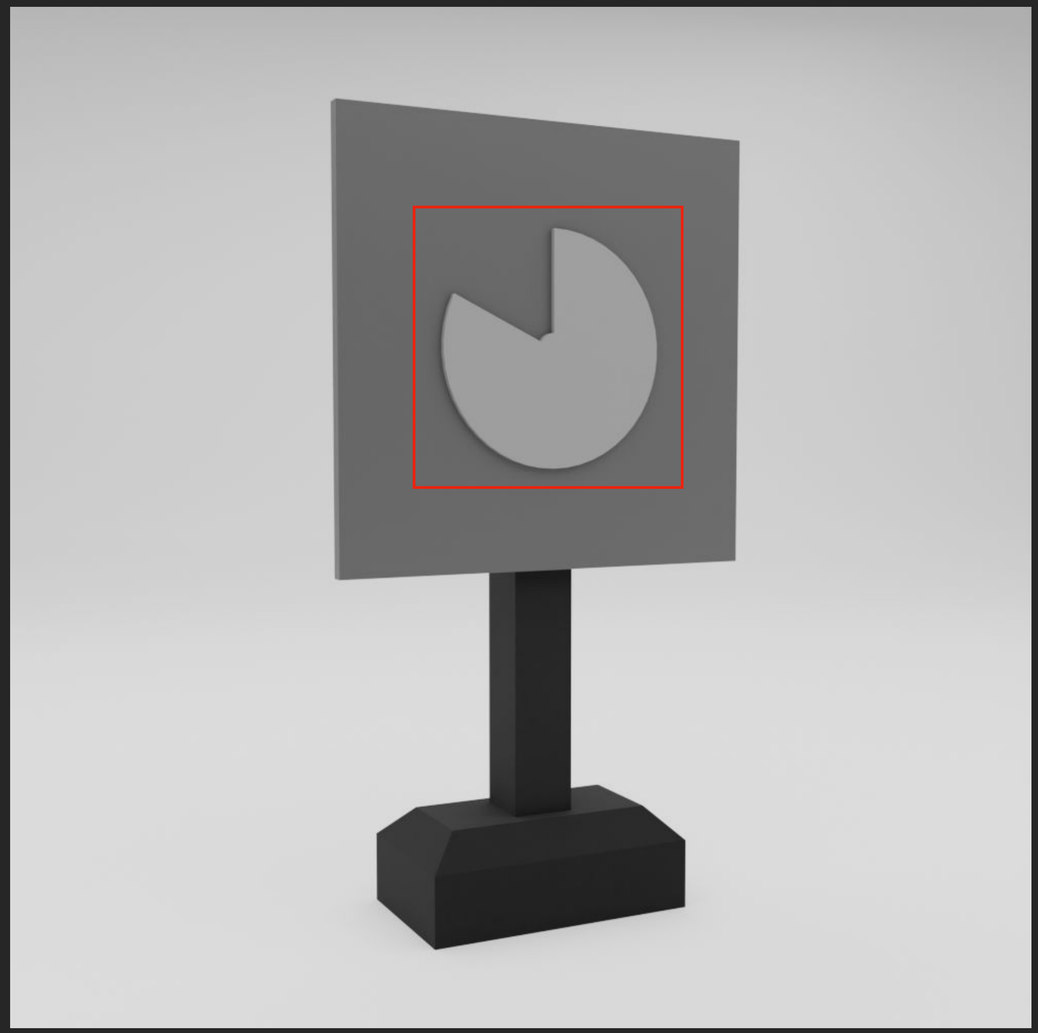
Apparatus

Thesis Work

Apparatus

Thesis Work

1. Easy to change Occluder



Apparatus

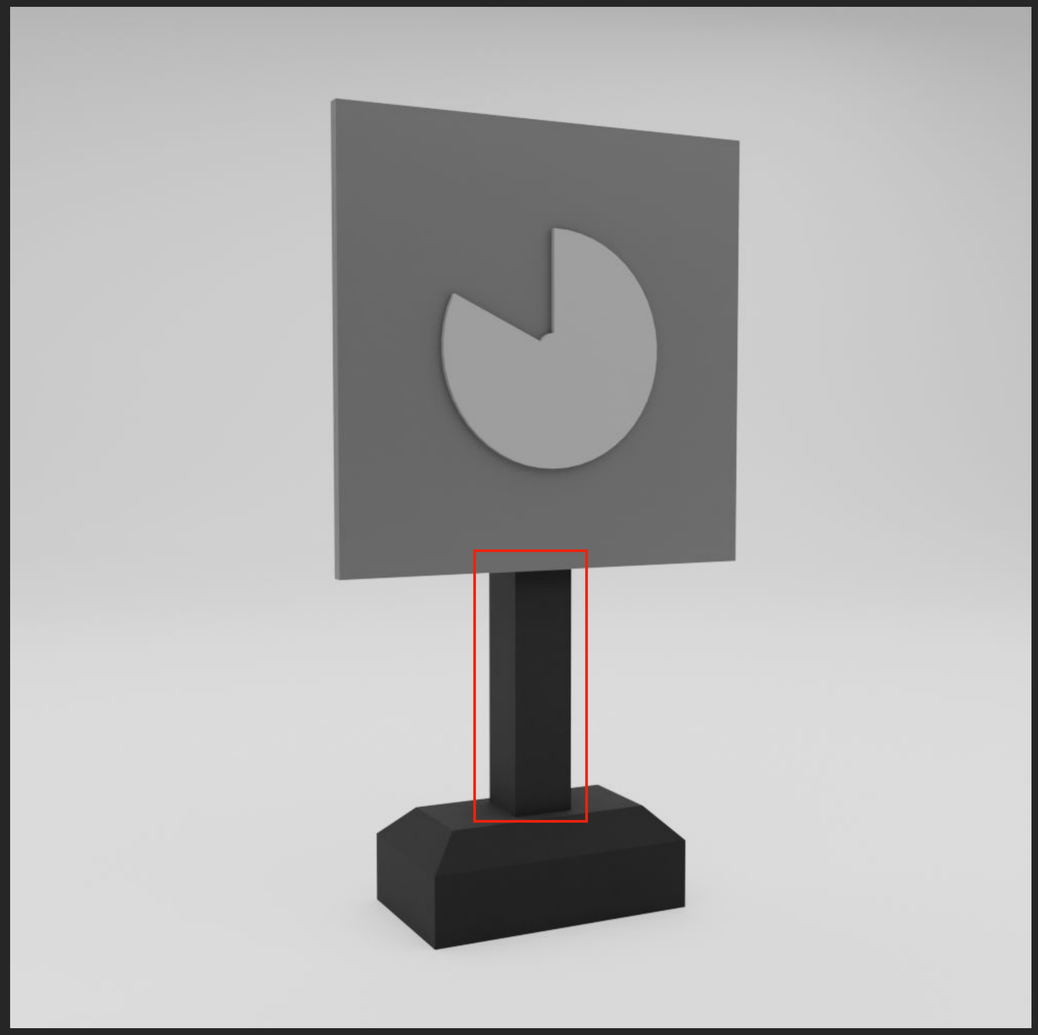
Thesis Work

1. Easy to change Occluder
2. Easy to change Backplate

Apparatus

Thesis Work

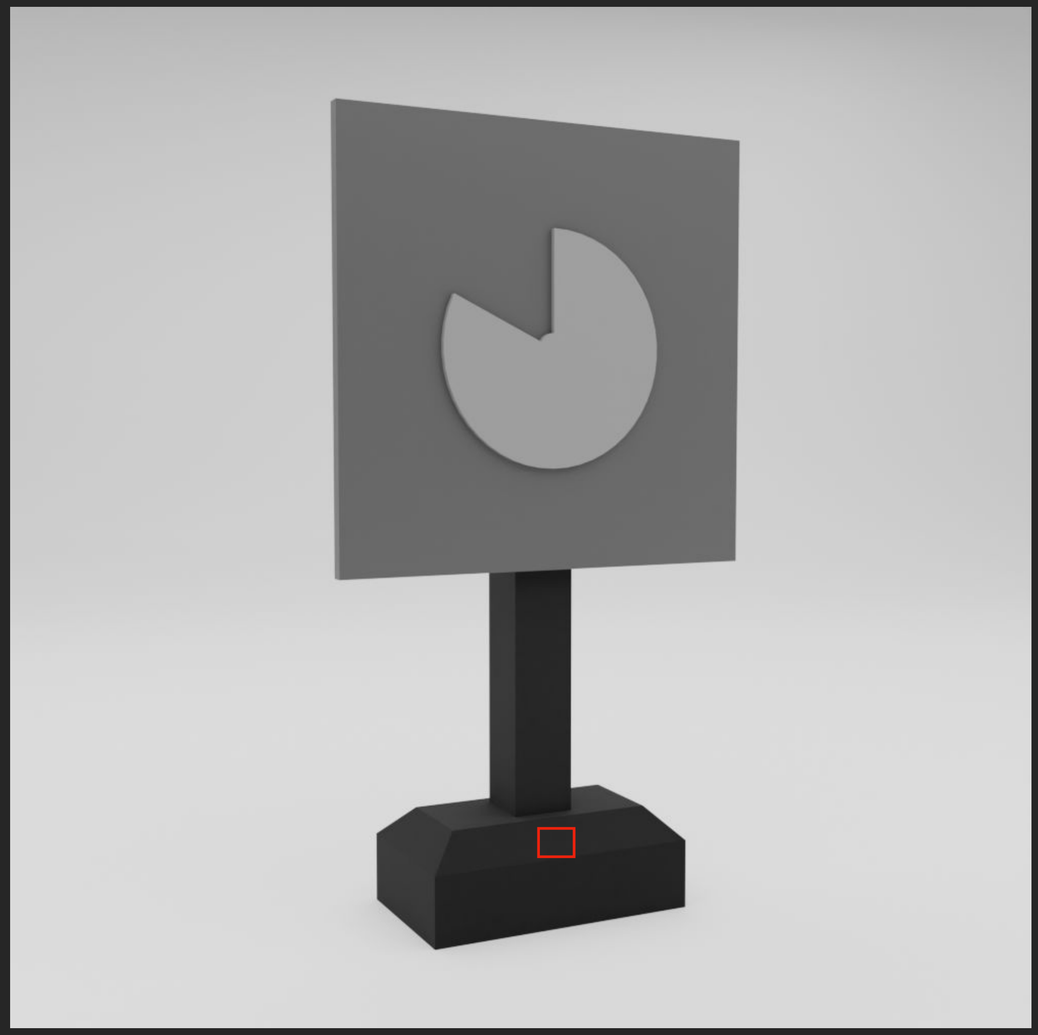
1. Easy to change Occluder
2. Easy to change Backplate
3. Adjustable in height



Apparatus

Thesis Work

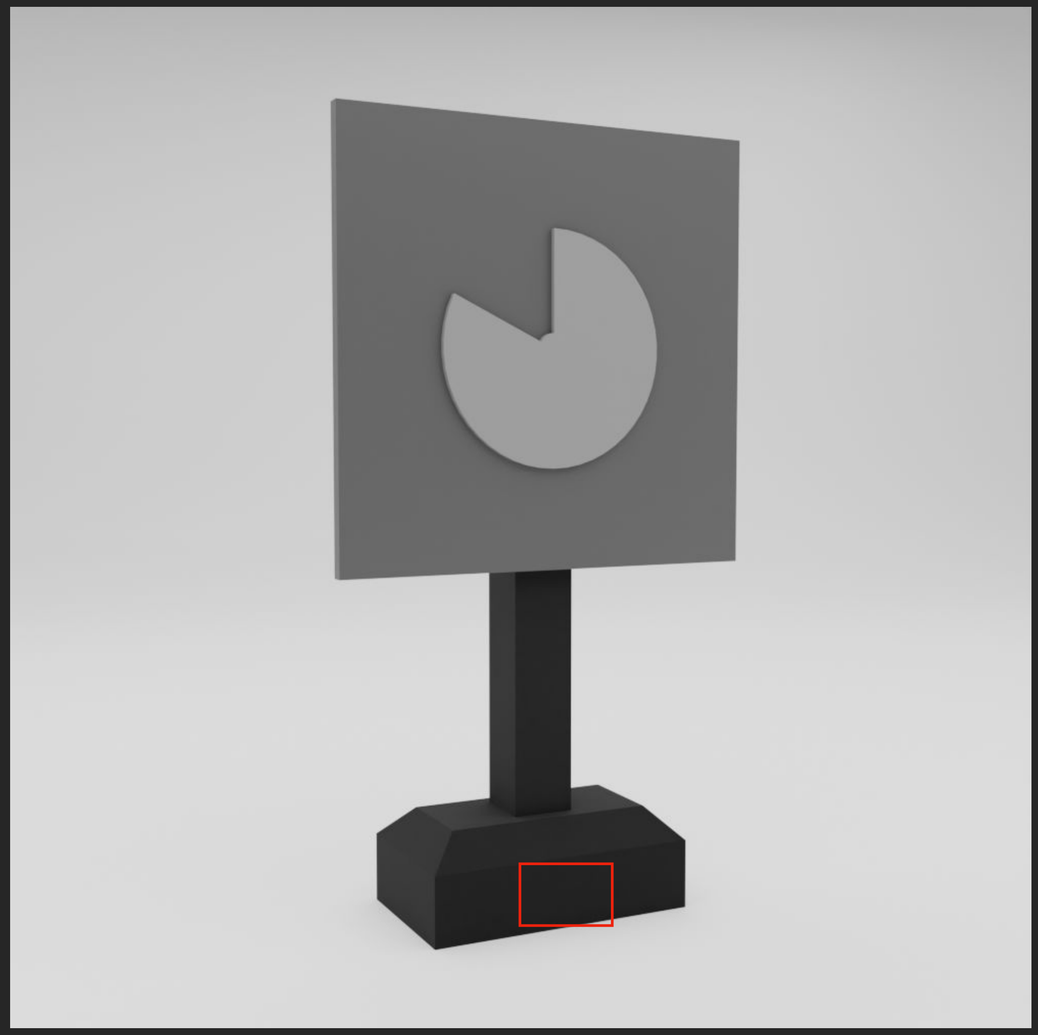
1. Easy to change Occluder
2. Easy to change Backplate
3. Adjustable in height
4. Light sensor



Apparatus

Thesis Work

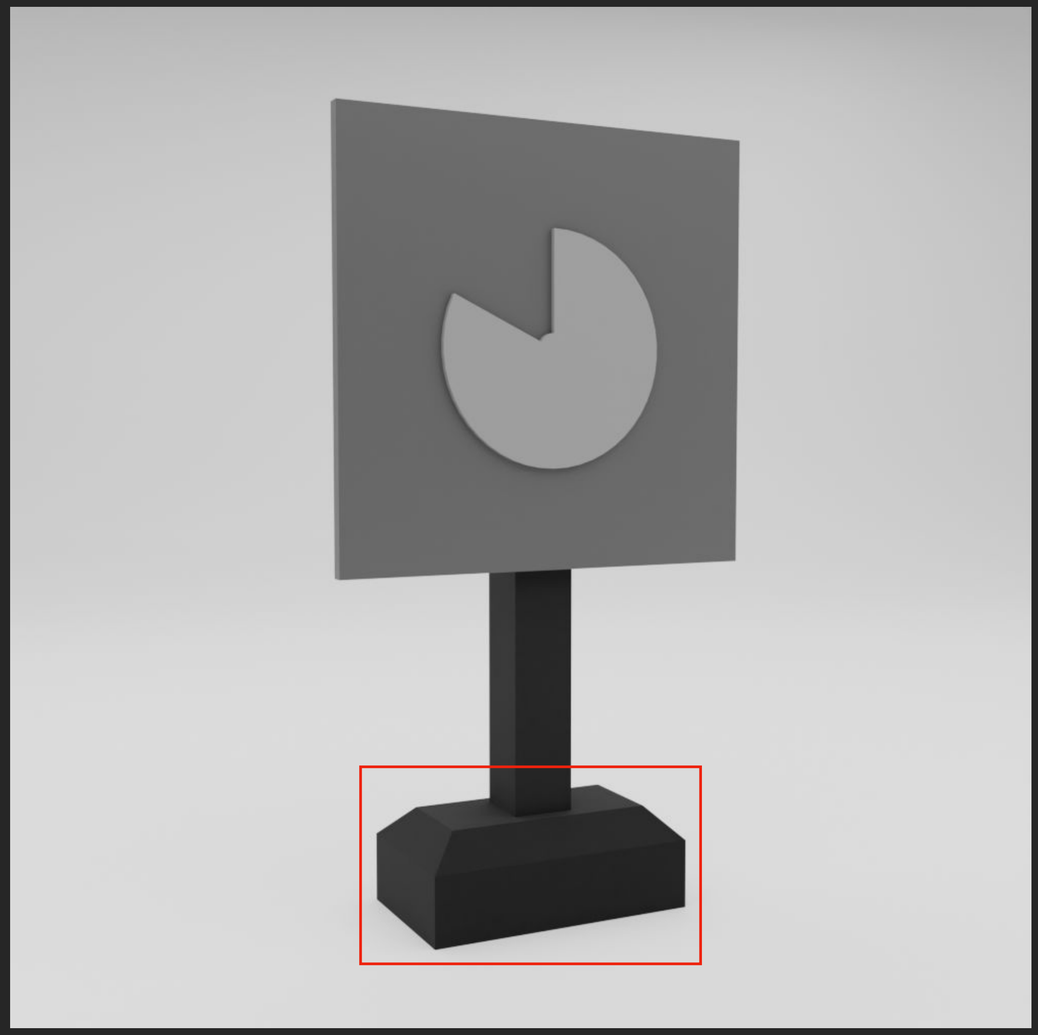
1. Easy to change Occluder
2. Easy to change Backplate
3. Adjustable in height
4. Light sensor
5. Display



Apparatus

Thesis Work

1. Easy to change Occluder
2. Easy to change Backplate
3. Adjustable in height
4. Light sensor
5. Display
6. Adjustable Speed



Apparatus

Thesis Work

1. Easy to change Occluder
2. Easy to change Backplate
3. Adjustable in height
4. Light sensor
5. Display
6. Adjustable Speed
7. Accept numpad input

Study Design

Thesis Work

Study Design - Variables

Thesis Work

A. Dependent Variable: Perceived number of white dots

B. Independent Variable: Occluder with different sized missing sectors

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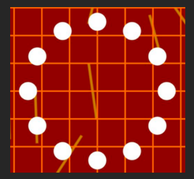

Study Design - Variables

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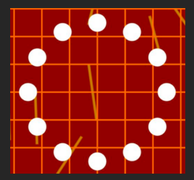
A. Dependent Variable: Perceived number of white dots

B. Independent Variable: Occluder with different sized missing sectors



Study Design - Variables

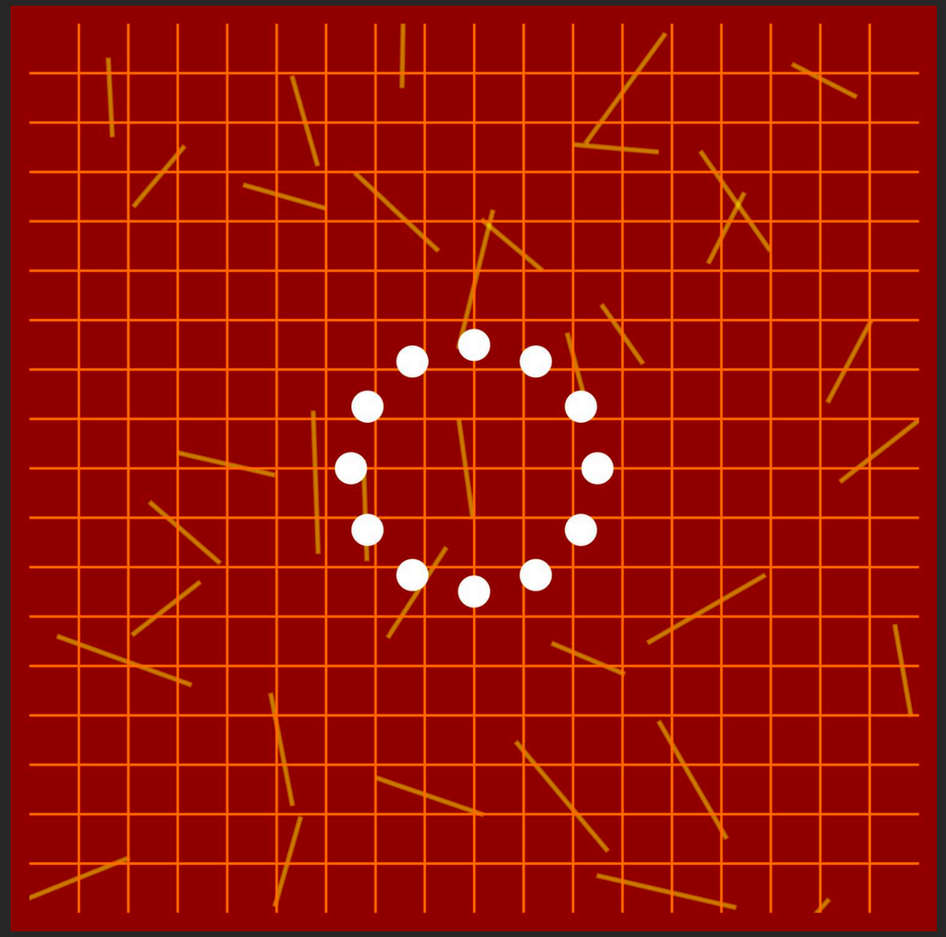
Thesis Work

Independent Variable: Occluder with different sized missing sectors

TRIAL	Missing Sector in °
1	30
2	36.9
3	60
4	66.9
5	90

Study Design

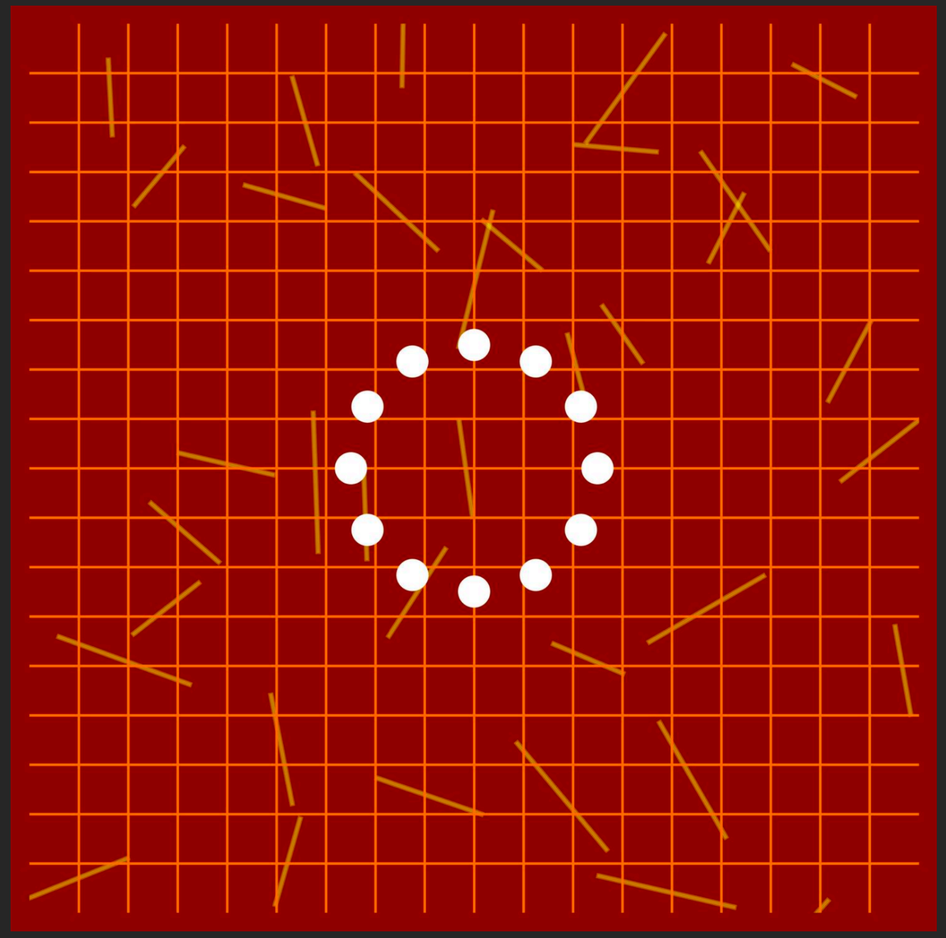
Thesis Work



Study Design

Thesis Work

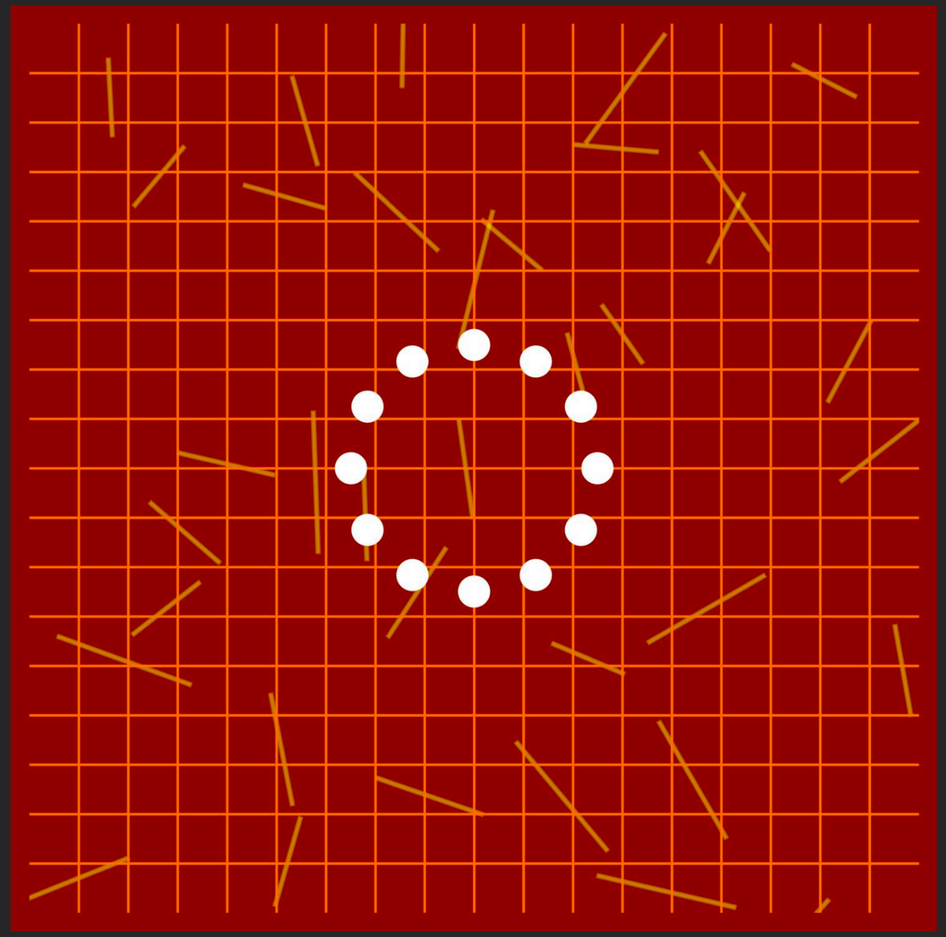
1. Setup random occluder



Study Design

Thesis Work

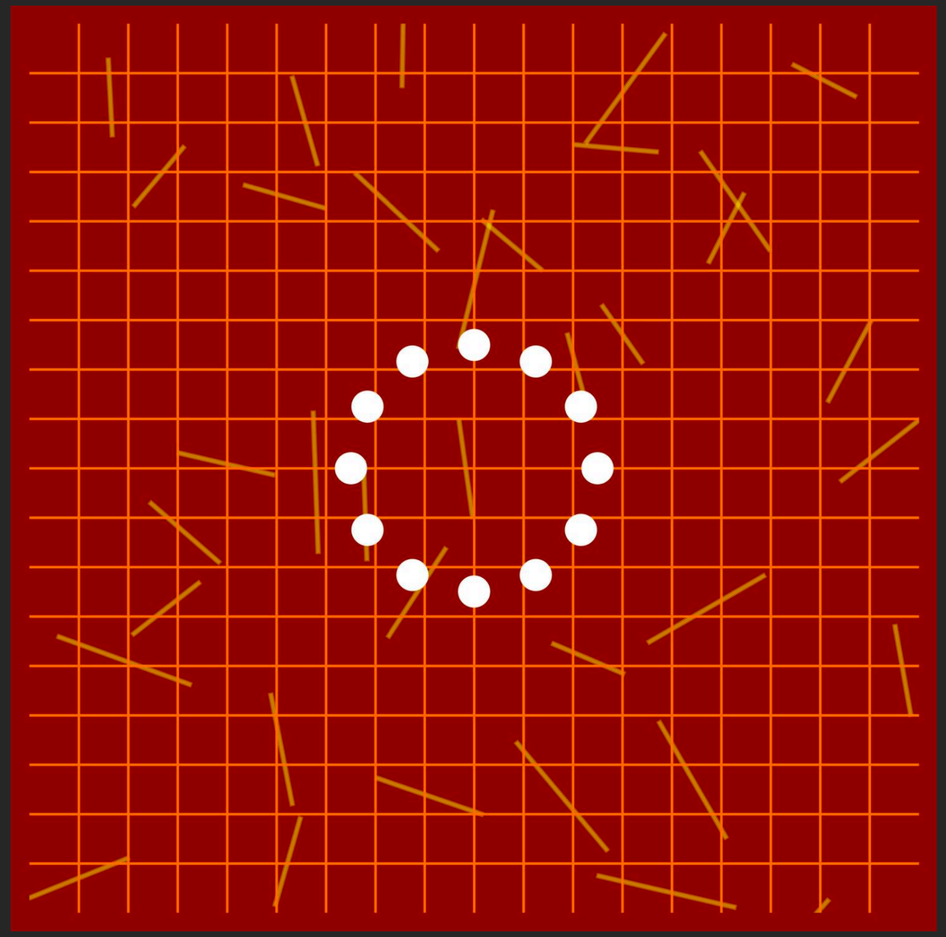
1. Setup random occluder
2. Participant starts trial



Study Design

Thesis Work

1. Setup random occluder
2. Participant starts trial
3. Participant enters number



Study Design

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3. Participant enters number
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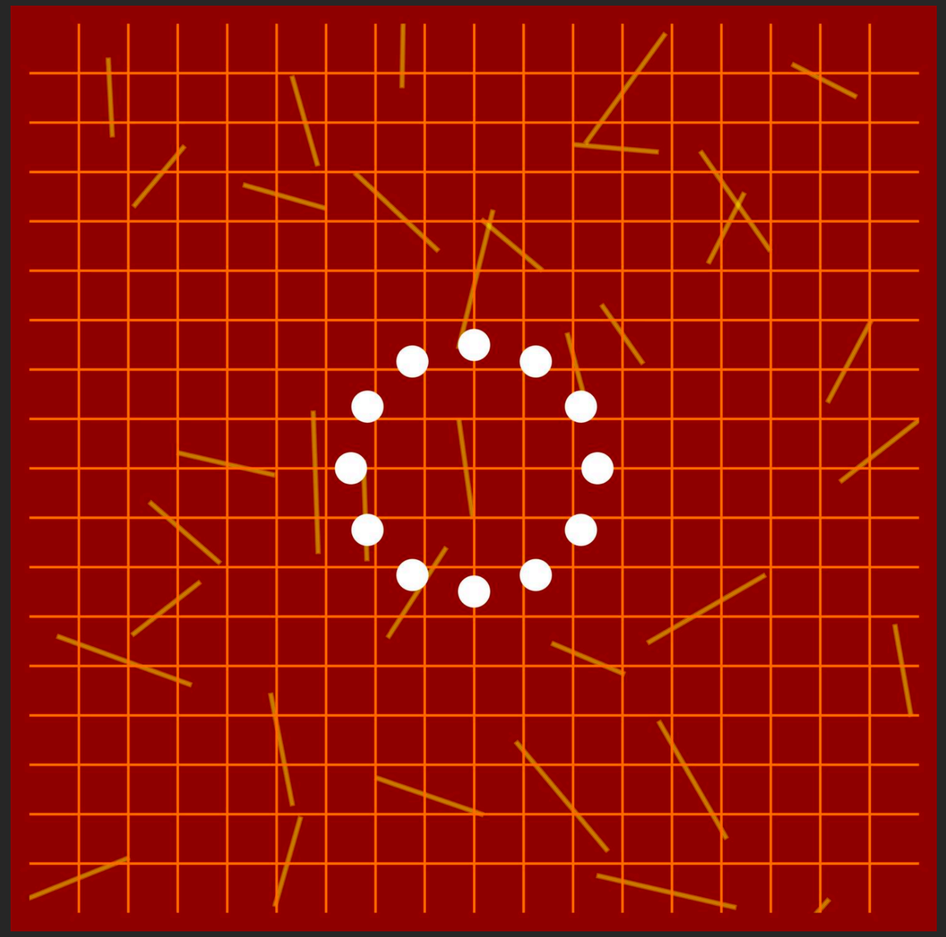

Study Design

Thesis Work

1. Setup random occluder
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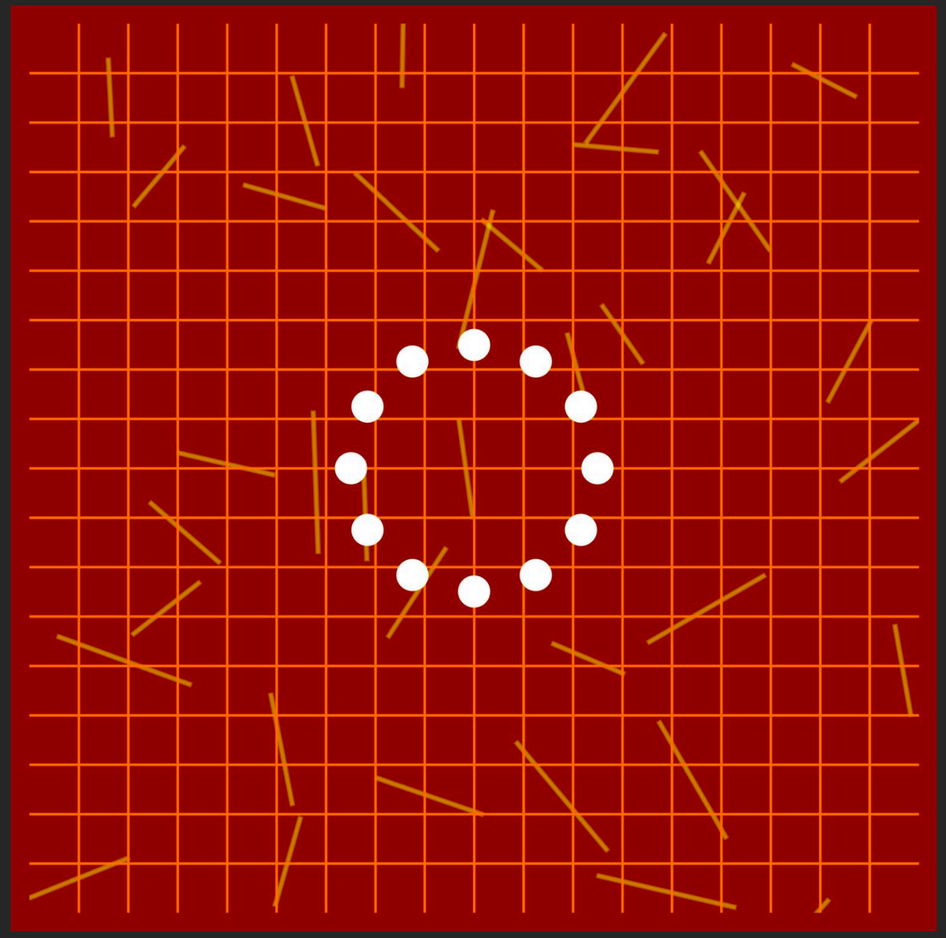
3. Participant enters number
4. Trial ends

A. Five different occluders in a random order

B. 15 trials total

C. Occluder change after every trial



Prototype Demo

Christian Haase

Thank you !

Paper

https://jov.arvojournals.org/article.aspx?articleid=2213216