

Tool-use Induces a Visual Illusion

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Background

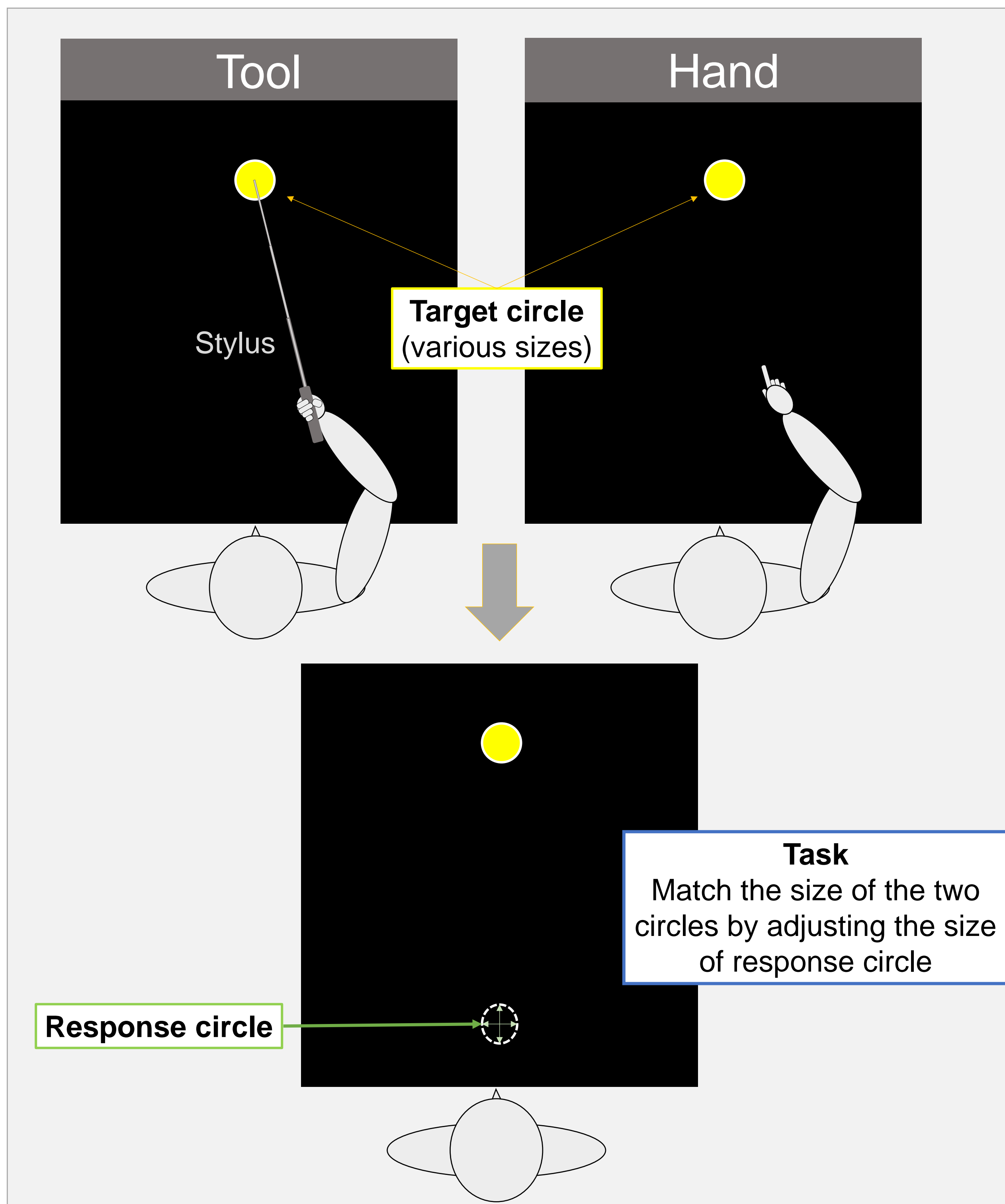
- Using a reach-extending tool changes perceived distance^{1,2,3}
- A visual object looks closer with a reach-extending tool presumably because the tool affords the ability to interact with the object

Questions

- Would using a reach-extending tool change the perceived size of a visual object?
- Would tool-use also influence visual perception when the distance is task-irrelevant?

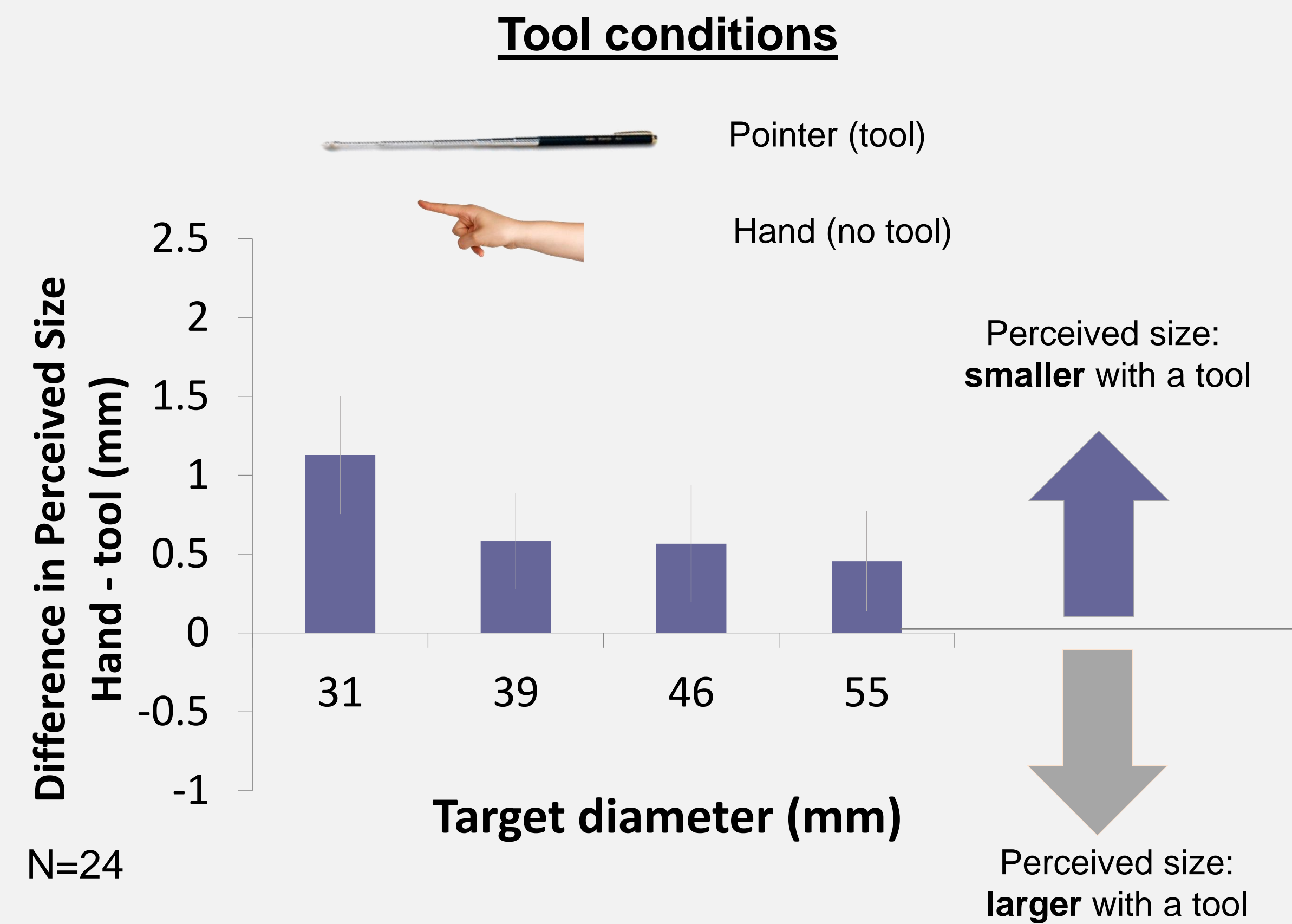
If a tool truly makes objects look closer they should also look smaller (due to size-distance invariance)

Method



Experiment 1

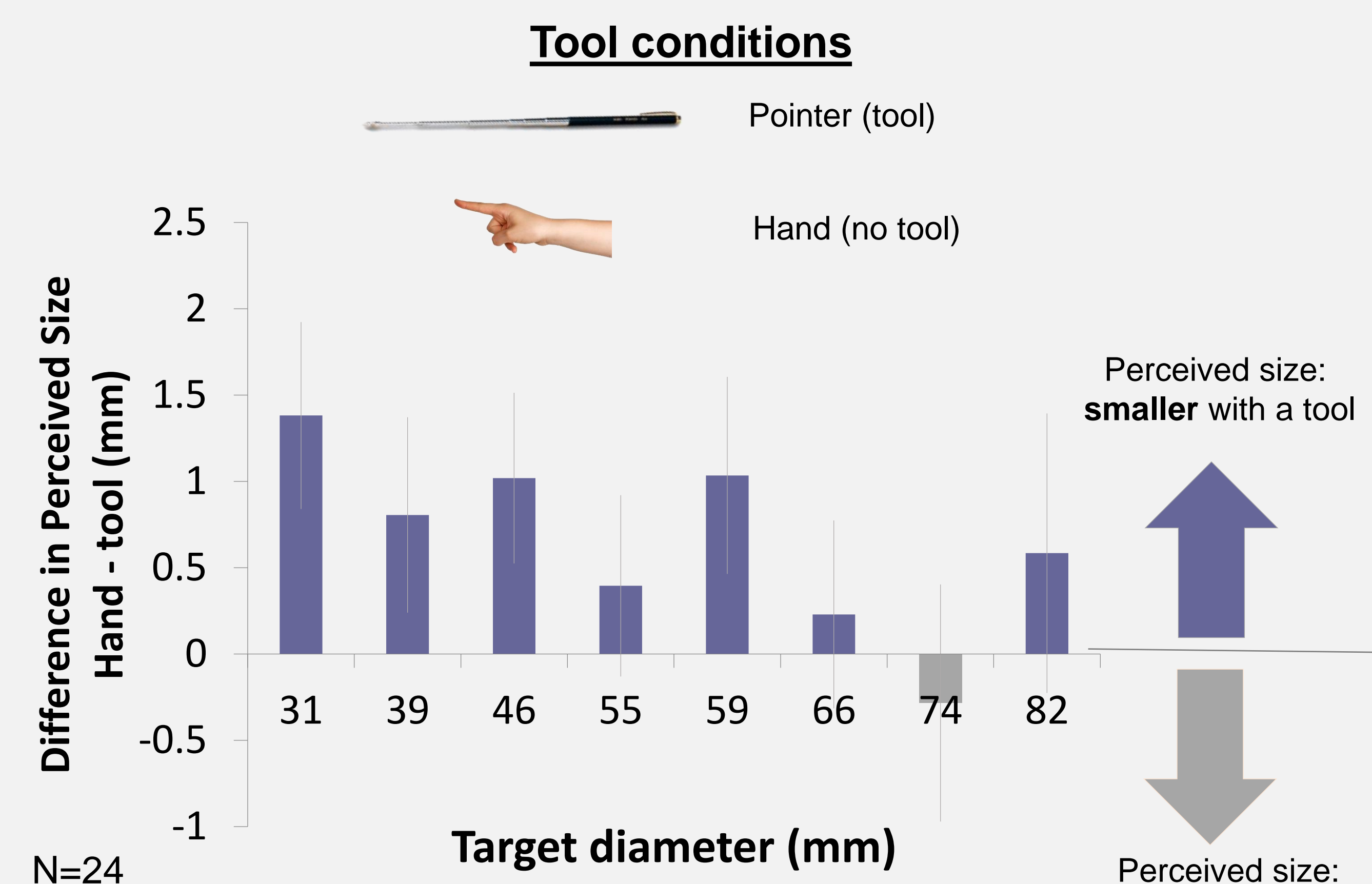
Would using a reach-extending tool change perceived size of circles? (4 target sizes)



Participants perceived target circles to be **smaller** with a reach-extending tool

Experiment 2

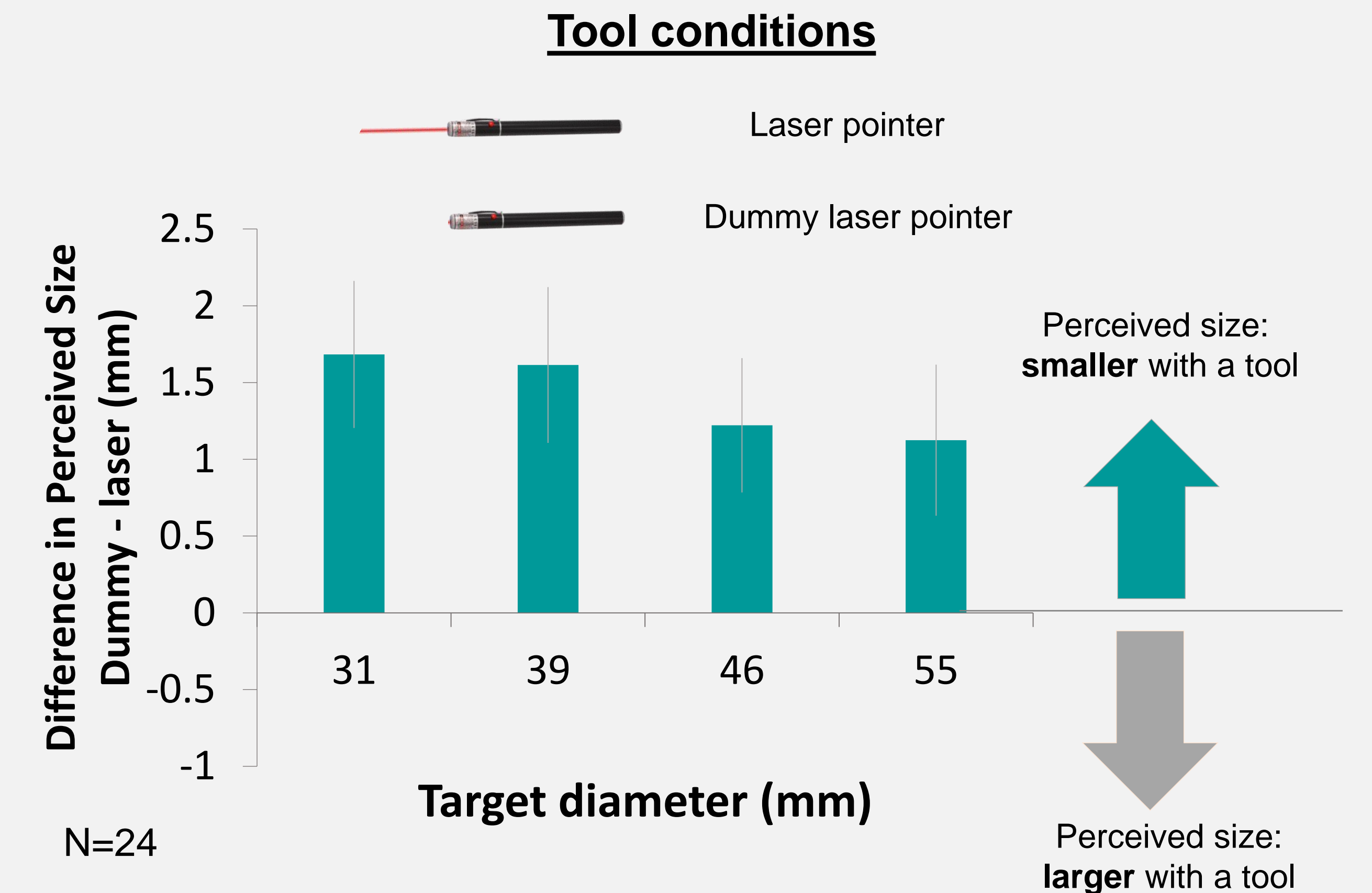
Would using a reach-extending tool change perceived size of circles? (8 target sizes)



Replicates the result that target circles appear **smaller** with tool-use

Experiment 3

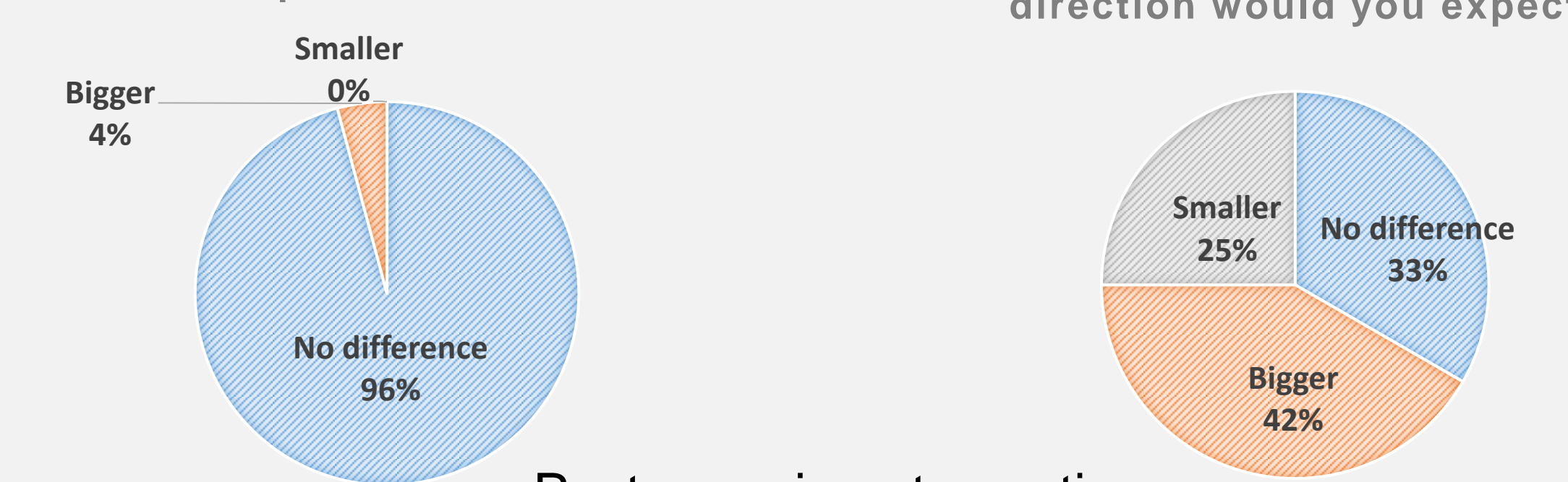
Would using a remote tool (laser pointer) change perceived size of circles?



Participants perceived target circles to be **smaller** with a laser pointer

Did you notice any physical differences in estimating sizes when you were using a laser pointer versus a dummy pointer?

Using a tool makes an object look closer to you. Can you guess whether it also changes the perceived size of the object? If you believe it does, which direction would you expect?



Conclusion

- Using a reach-extending tool (a stylus and a laser) changed the perceived size of visual objects
- Perceived size was smaller with a reach-extending tool

- The tool truly alters perceived distance which, in turn, affects perceived size due to size-distance invariance

