

“Bites & Dents”: The visual perception of negative parts

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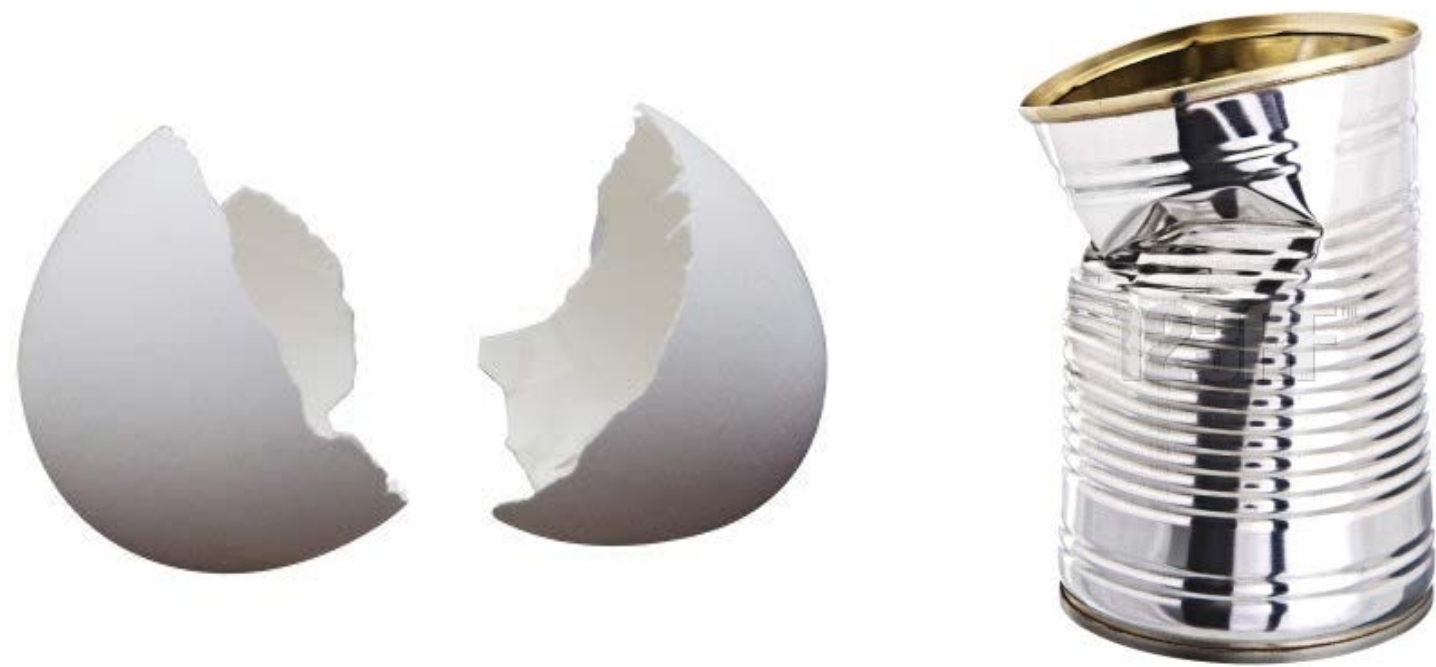


Background

Causal History

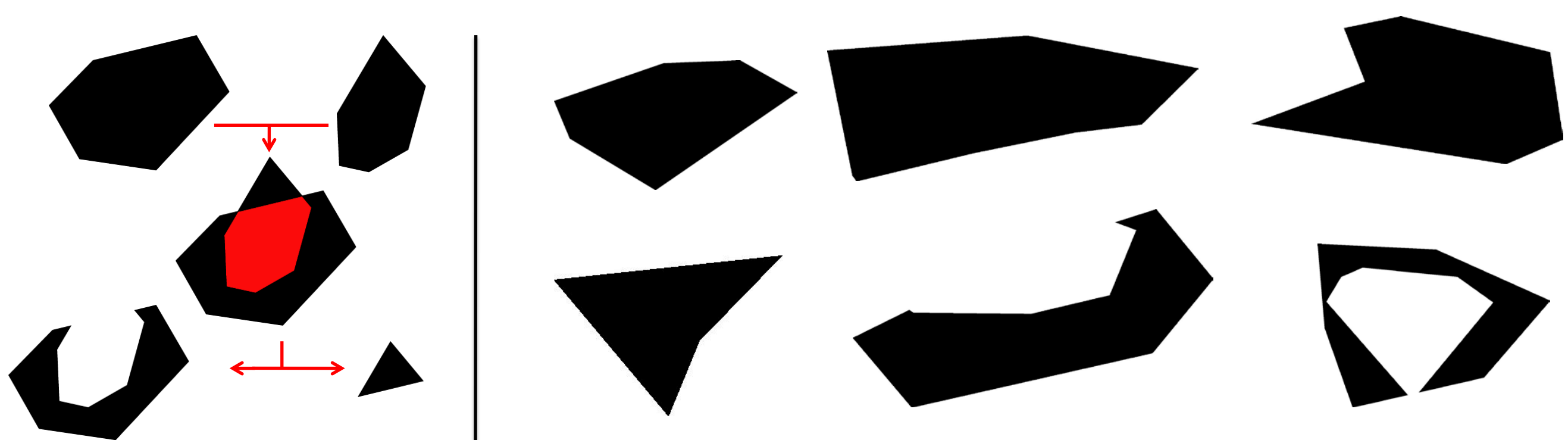


Negative Parts

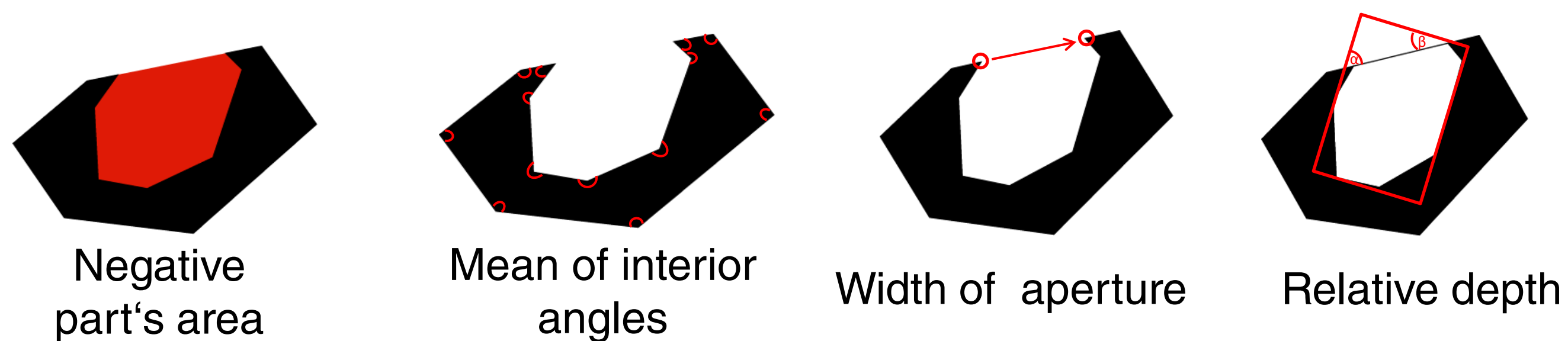


Hexagon world (stimuli)

Stimuli were created from convex, irregular hexagons. From half of the stimuli, a portion of the shape was deleted by random intersection with another hexagon and removing the region of overlap.

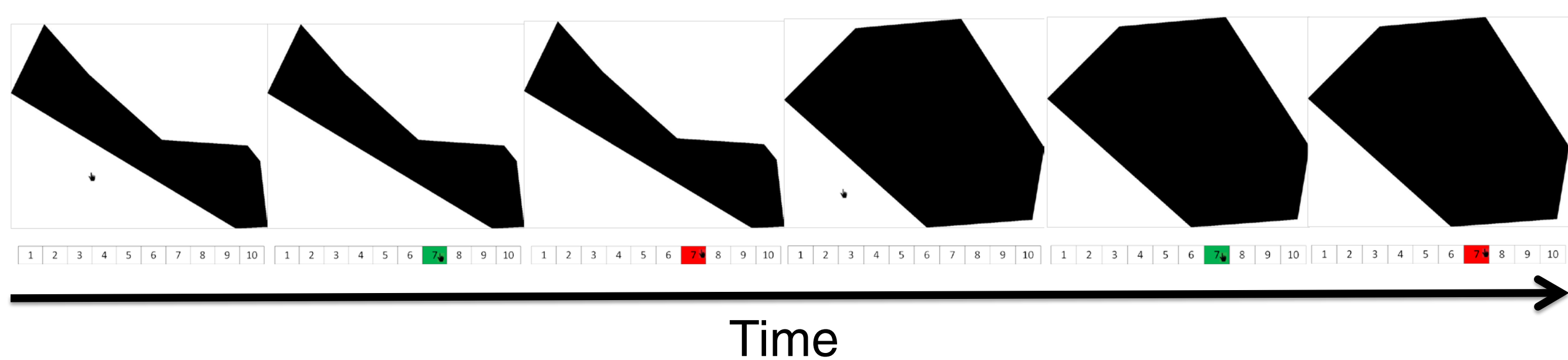


Stimulus statistics



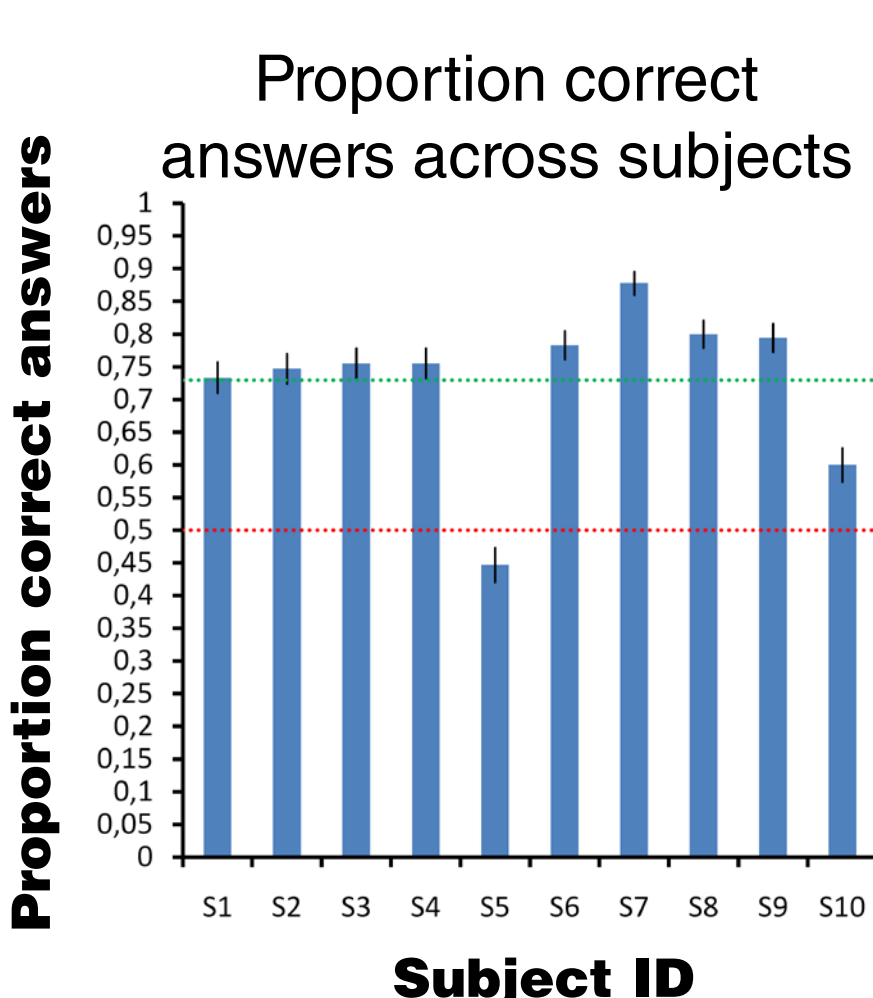
Task

We presented different shapes in different sizes and orientations. Subjects indicated with a cursor on a 10-point scale the extent to which each object appeared to them to be ‘bitten’.

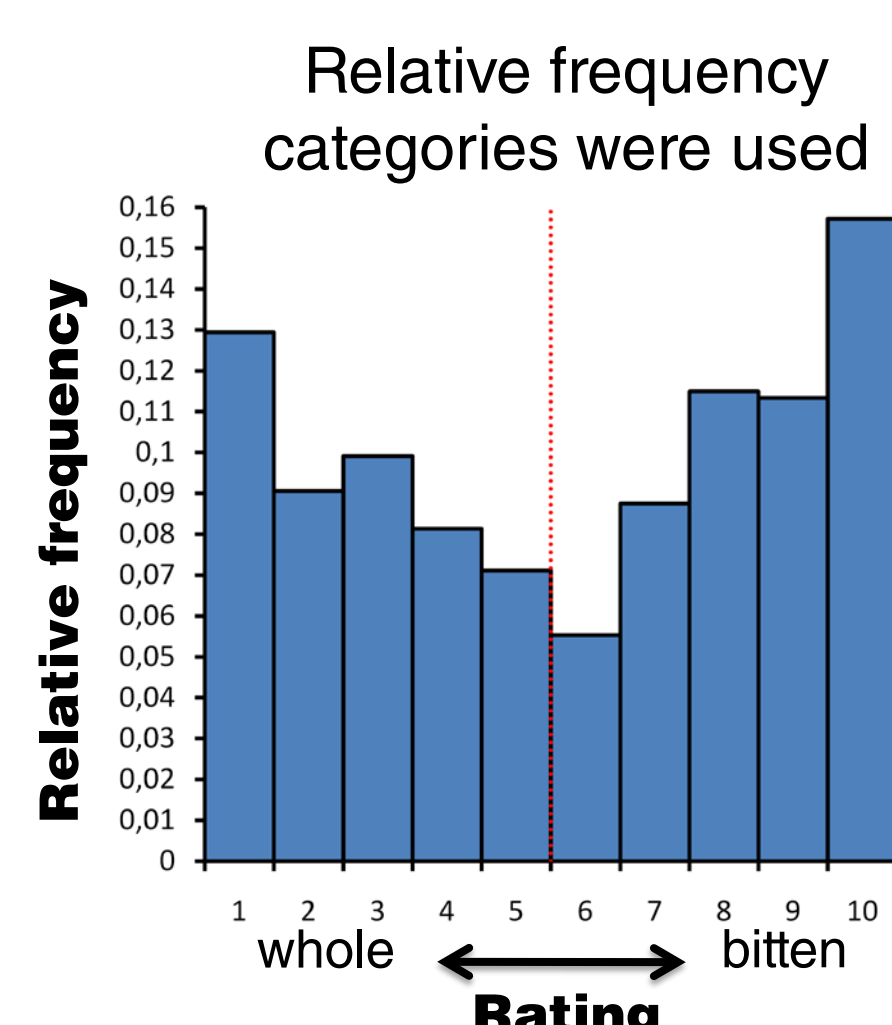


Results (Experiment 1)

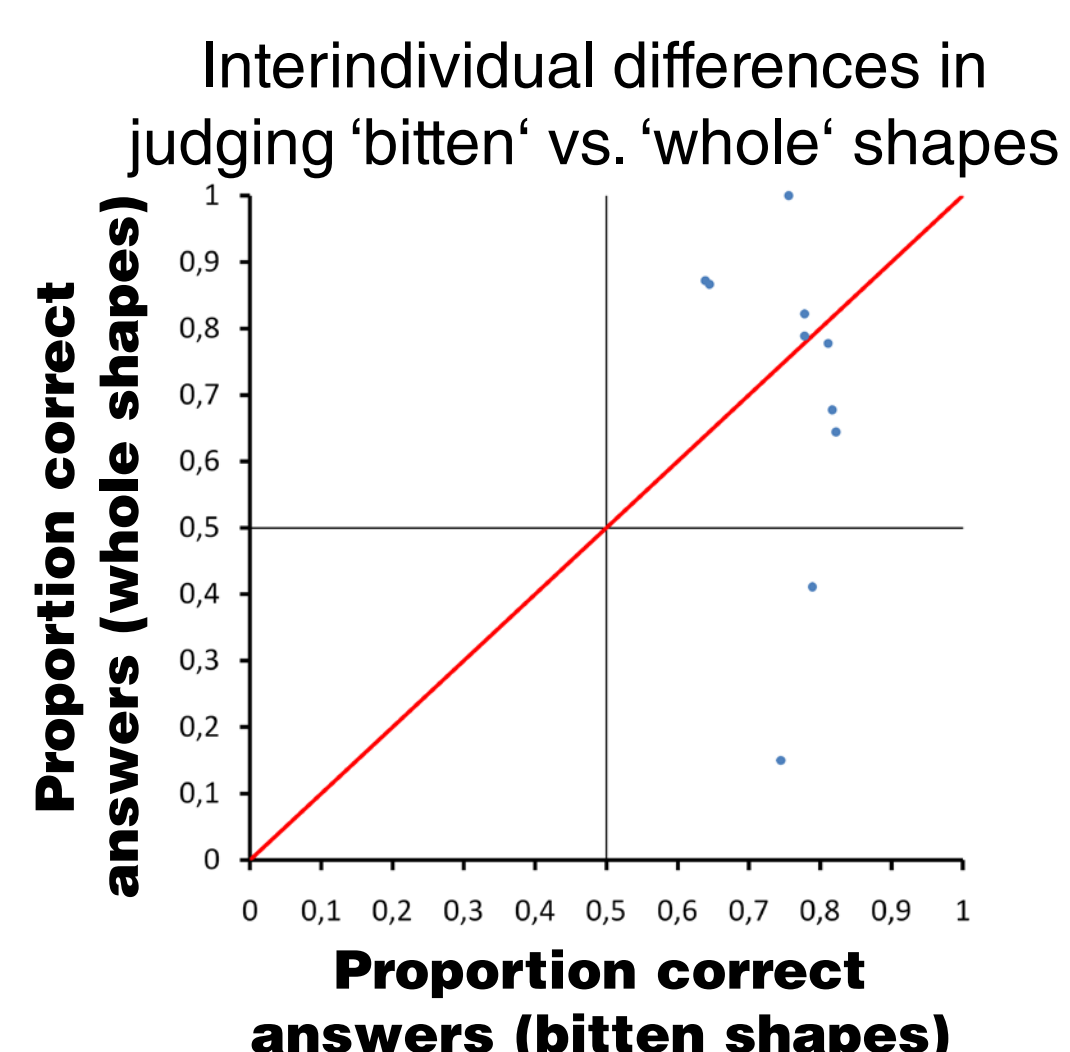
Subjects can do the task



Subjects are confident

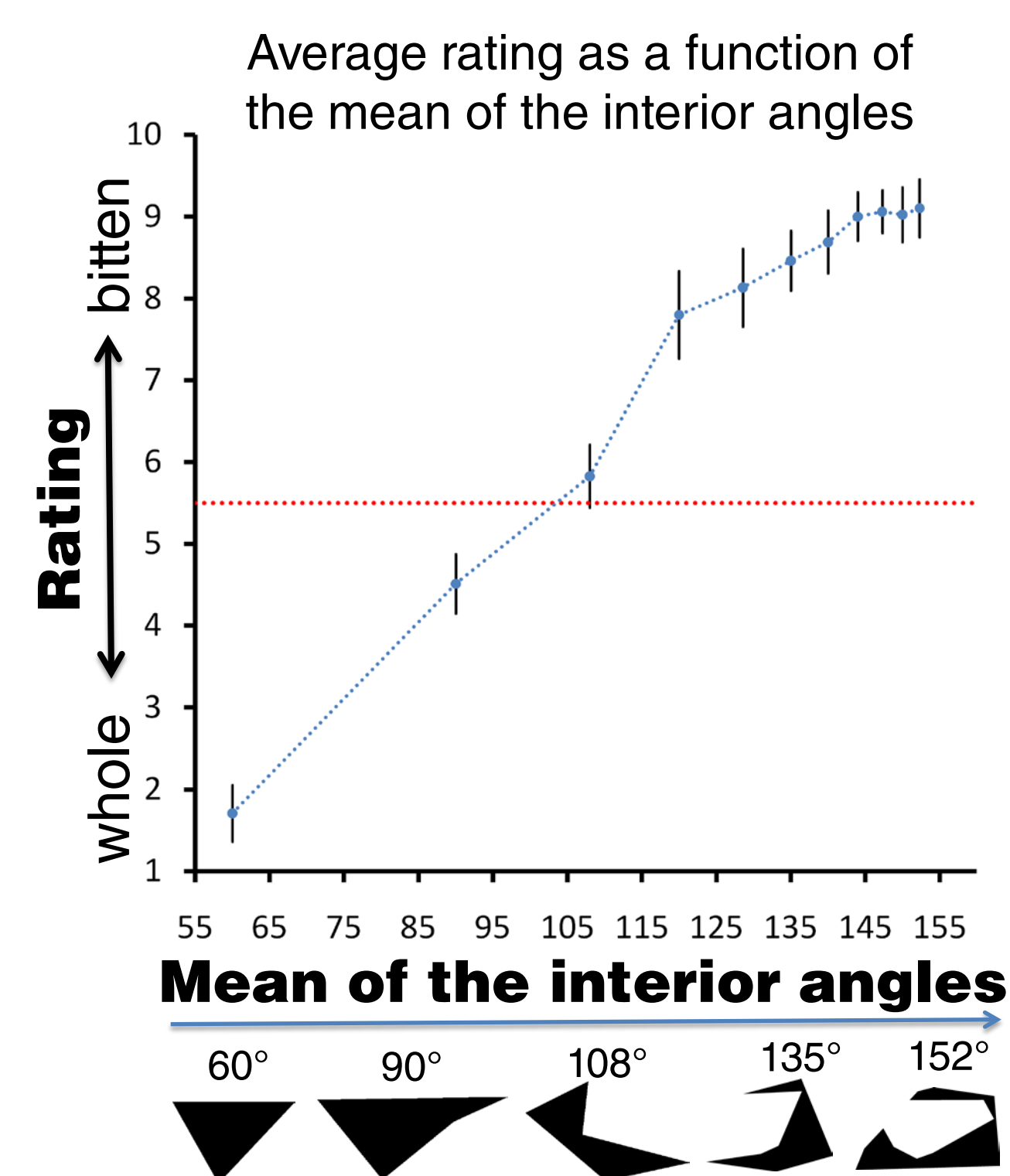


Differences in judgements

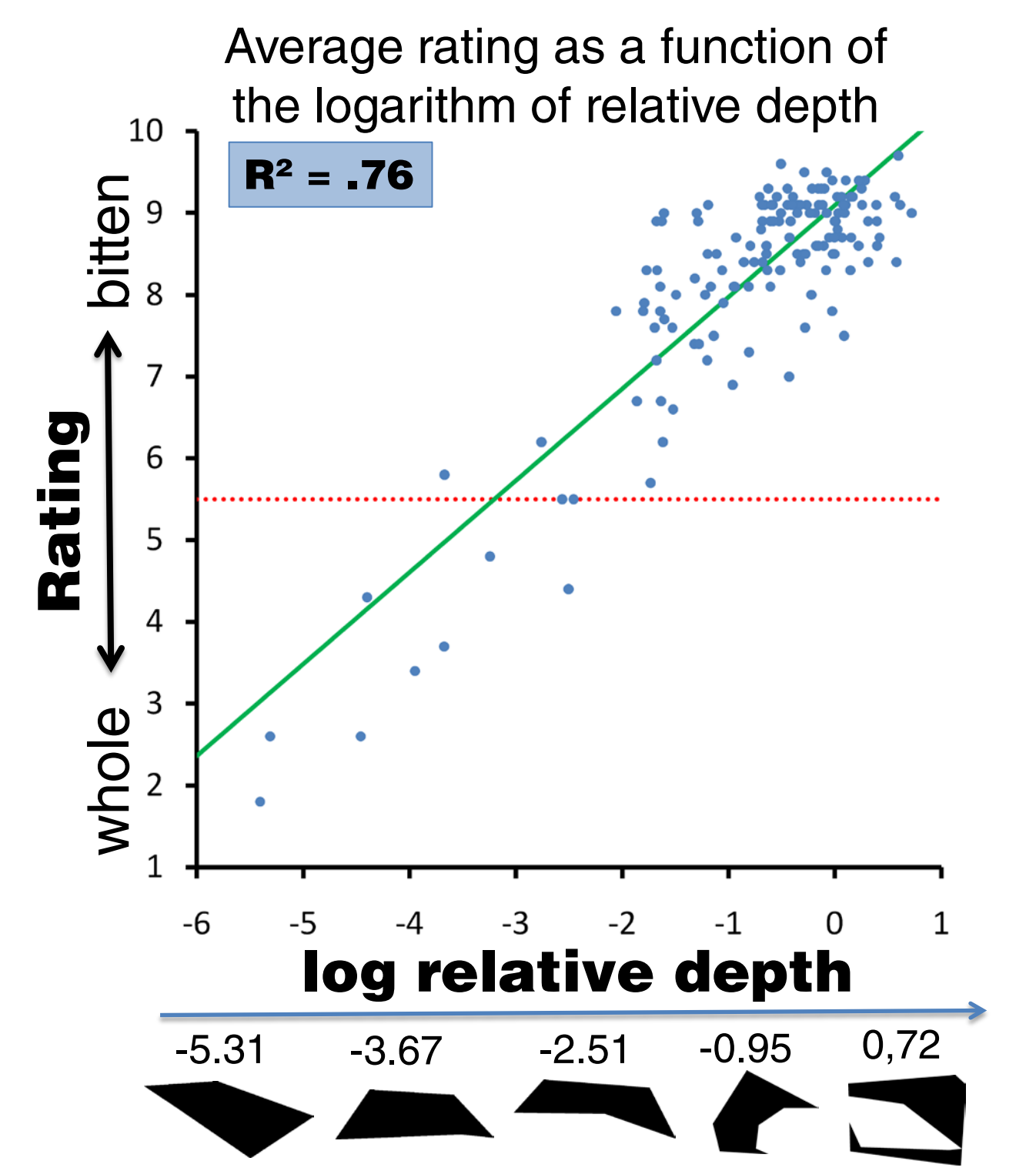


Results (Experiment 1)

The more angles, the more ‘bitten’

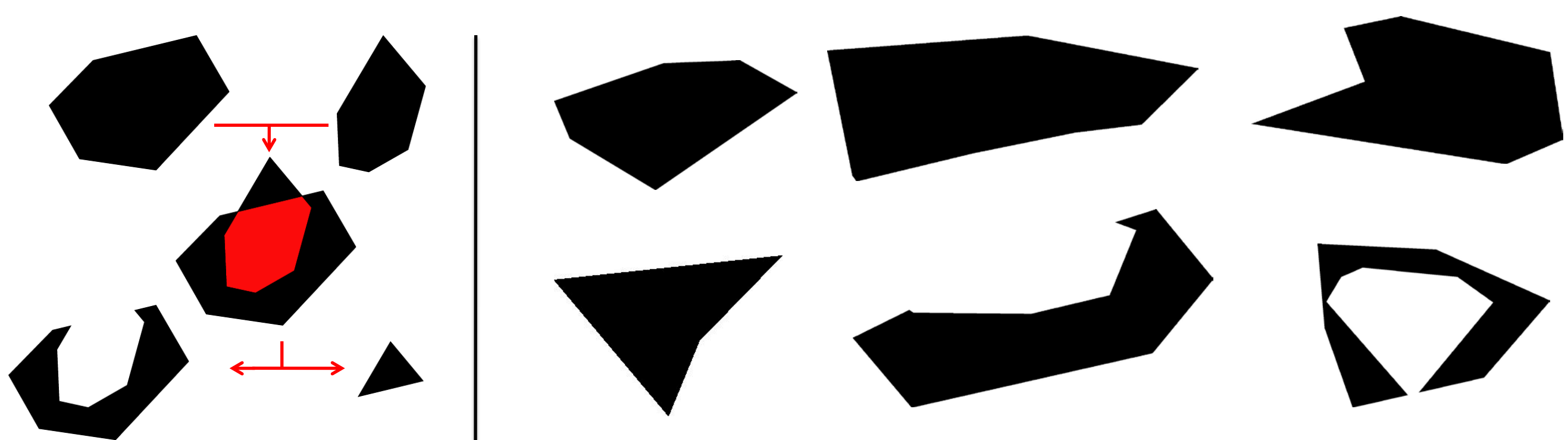


The more concave, the more ‘bitten’

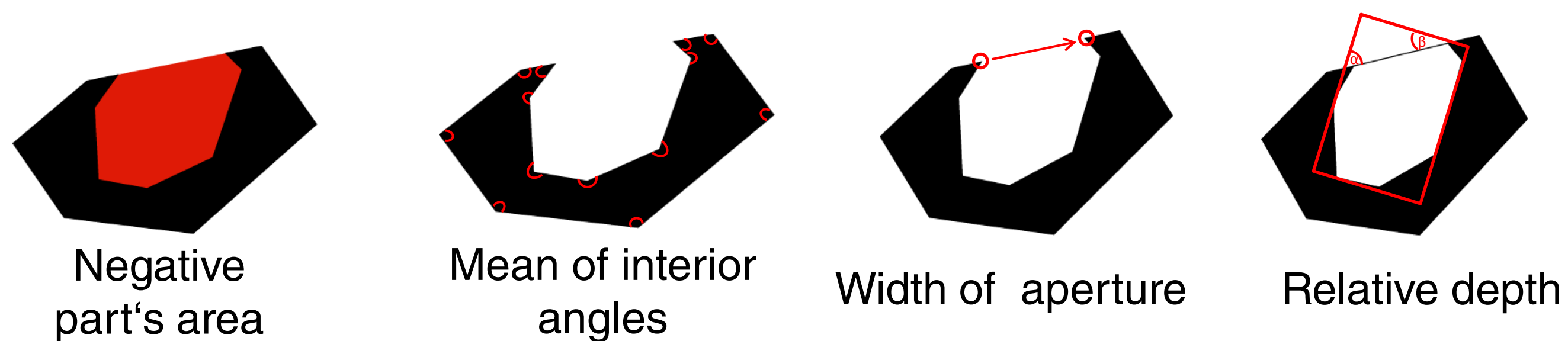


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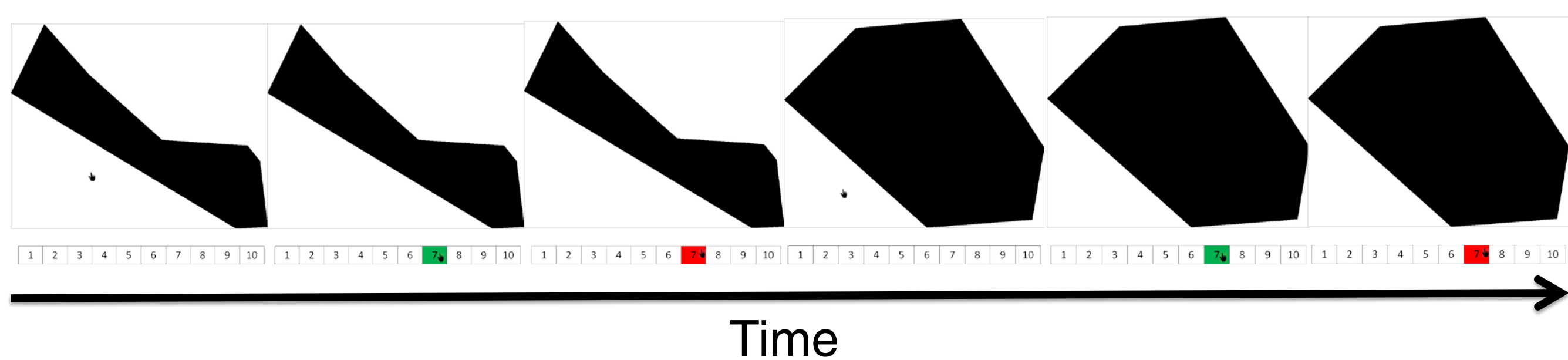


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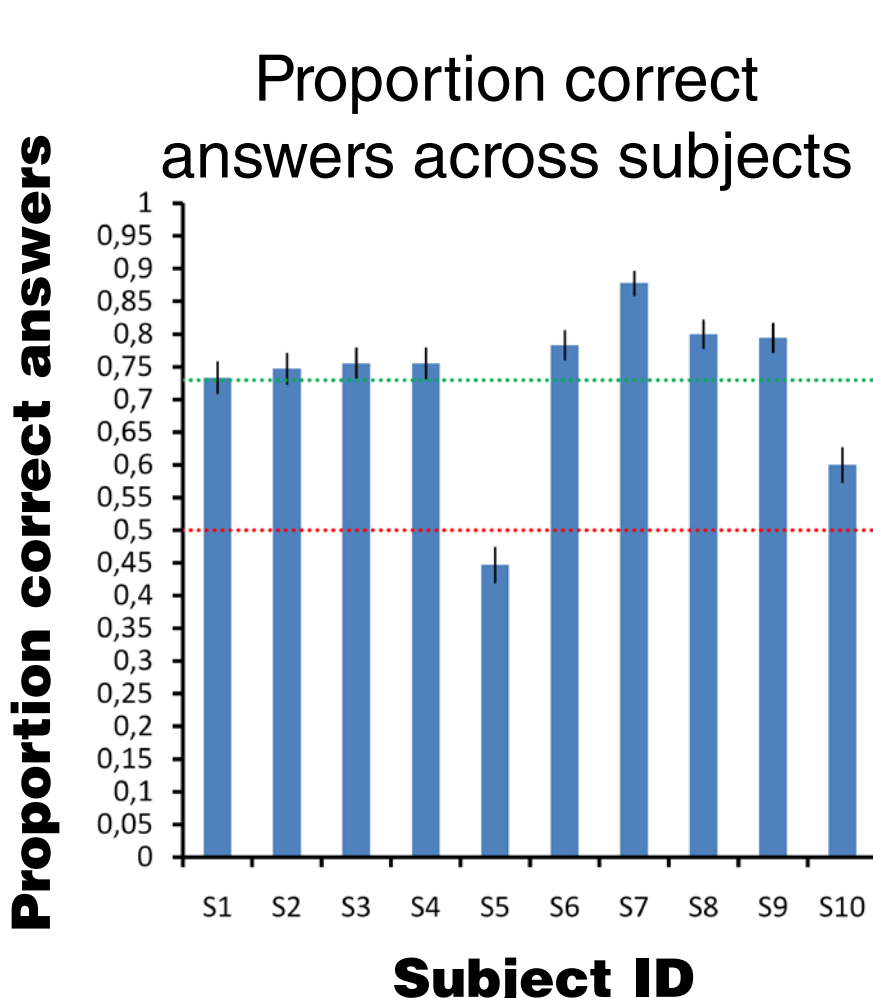
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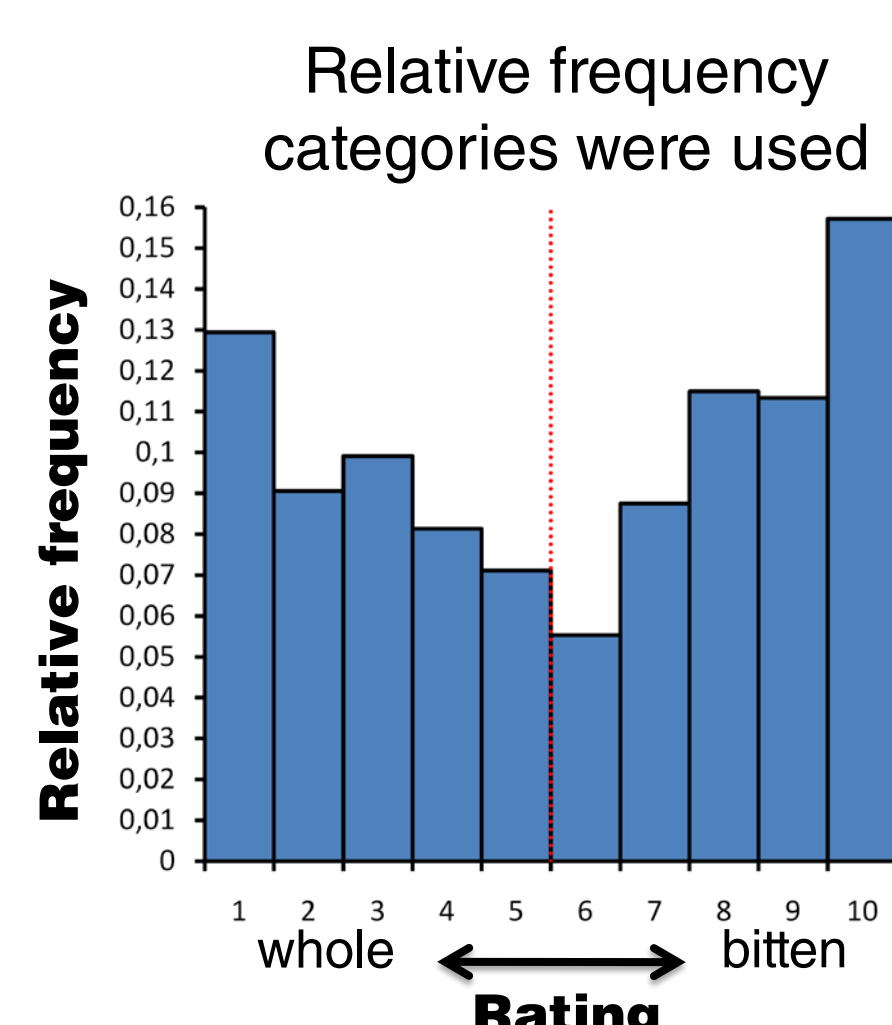


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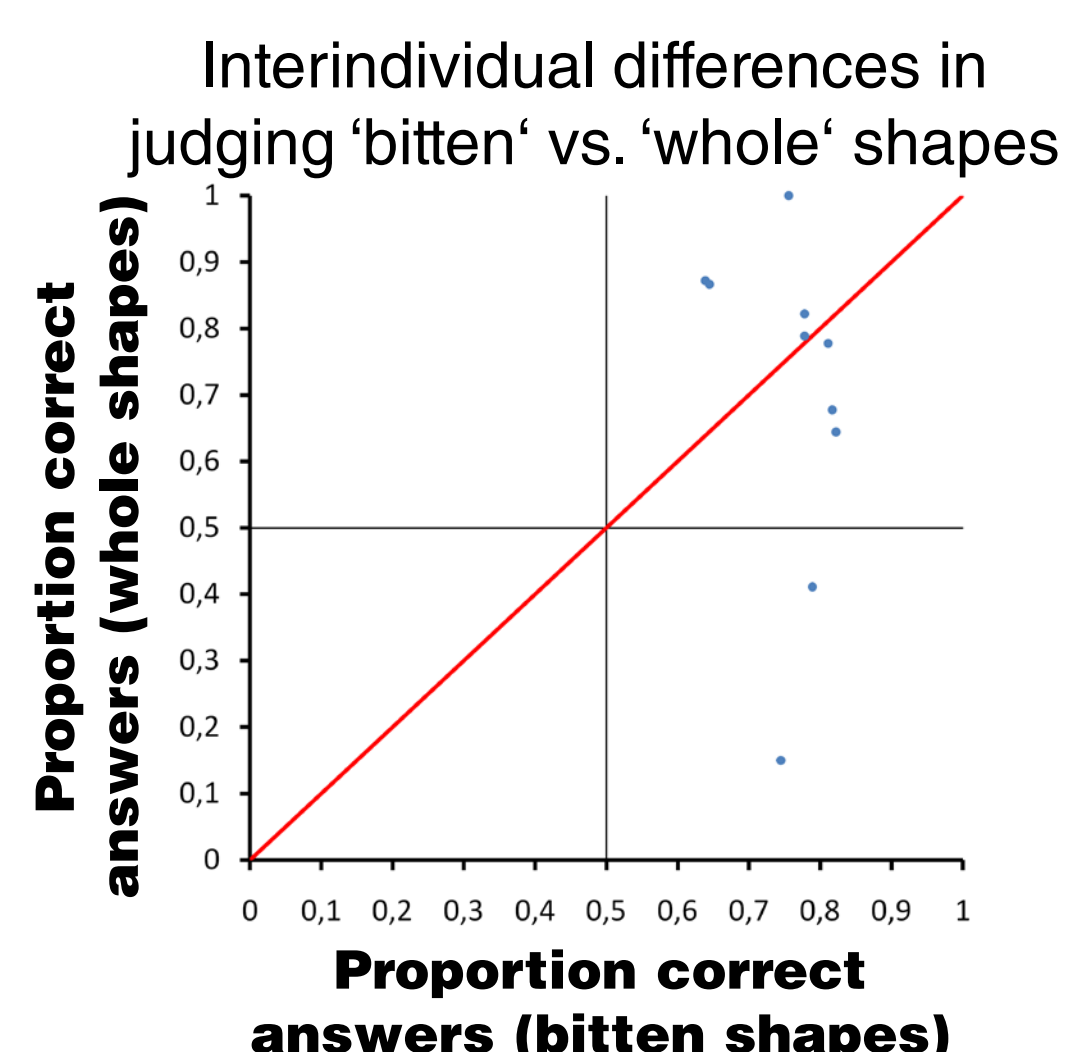
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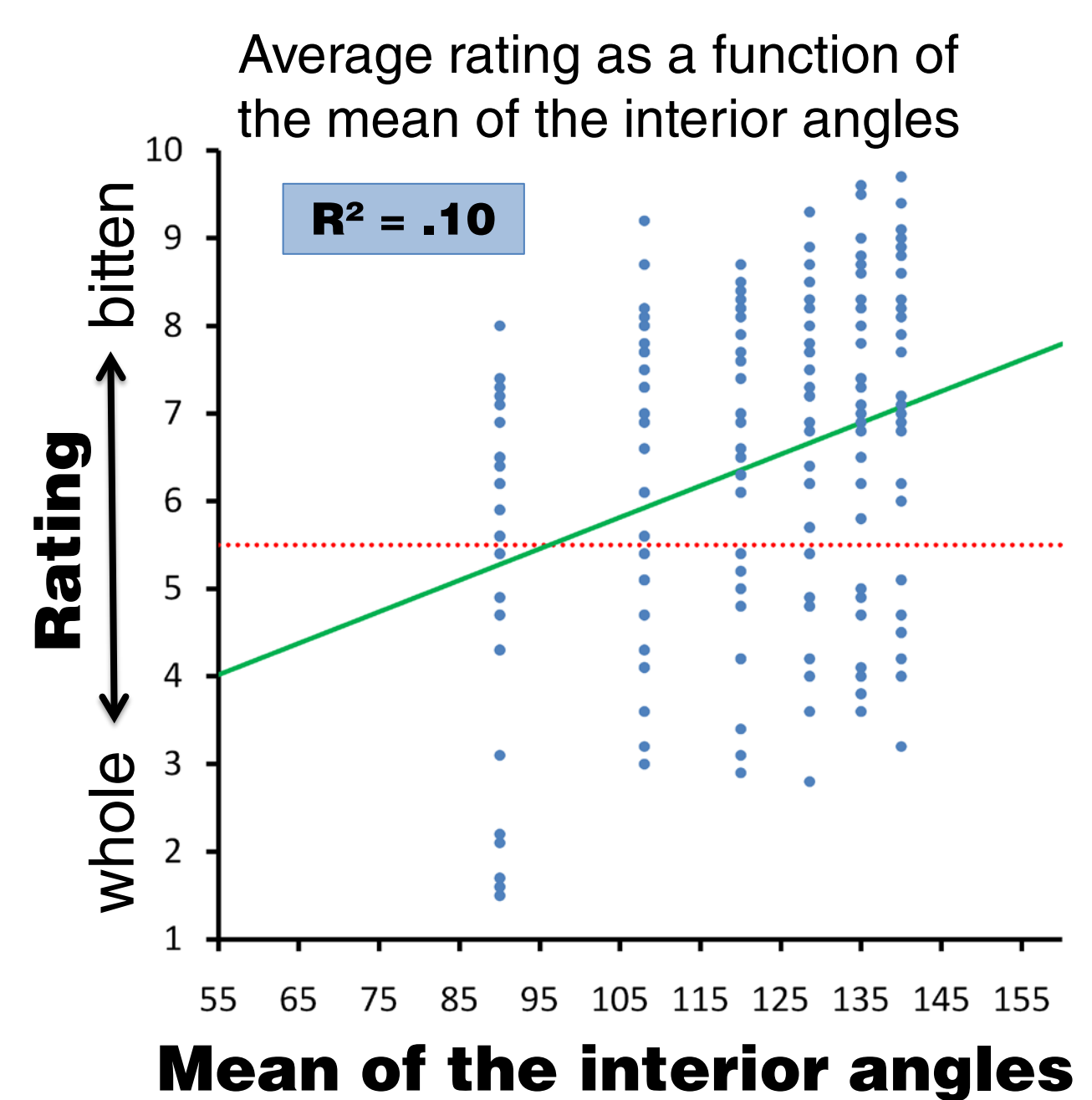


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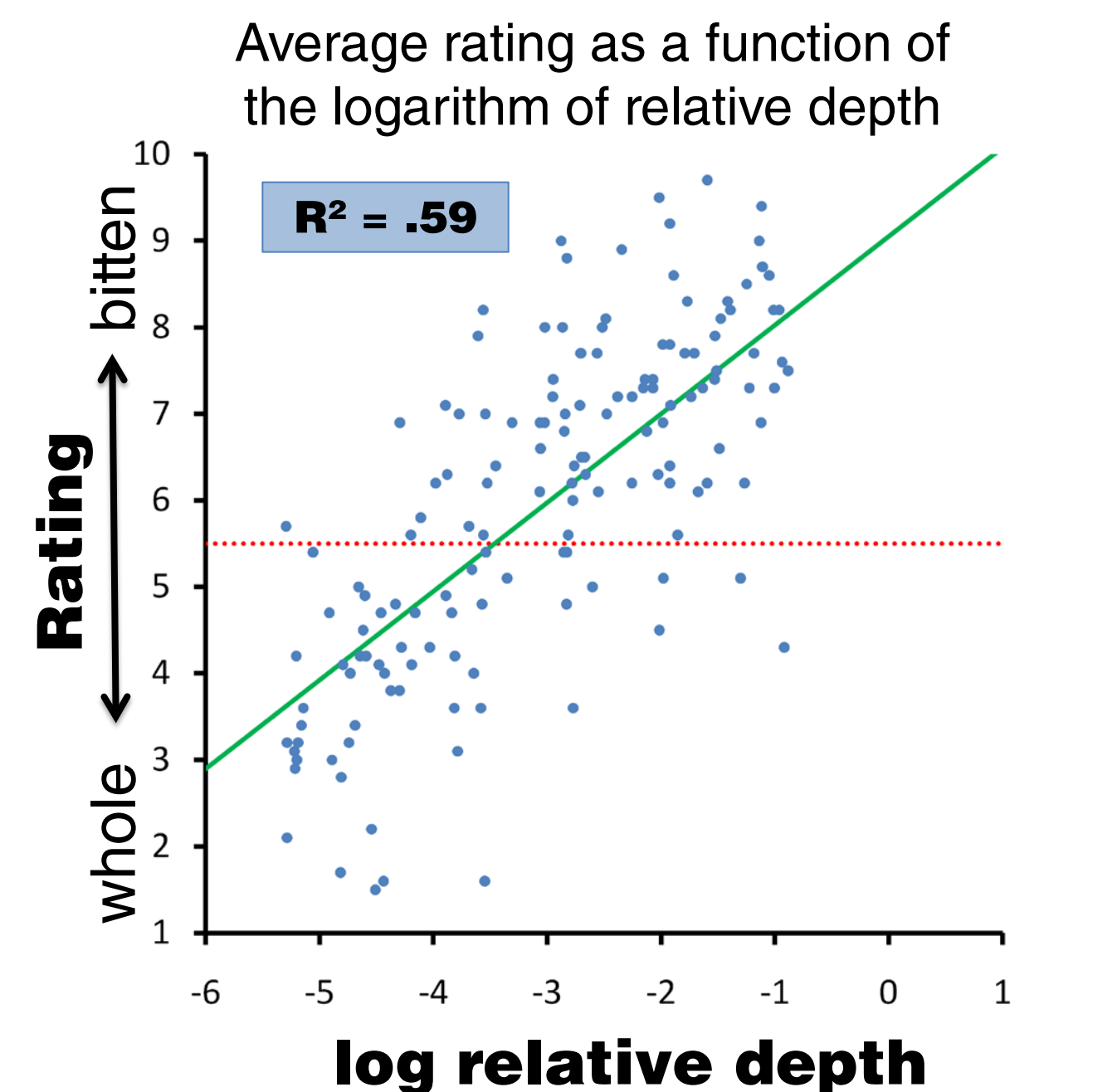


Results (Experiment 2)

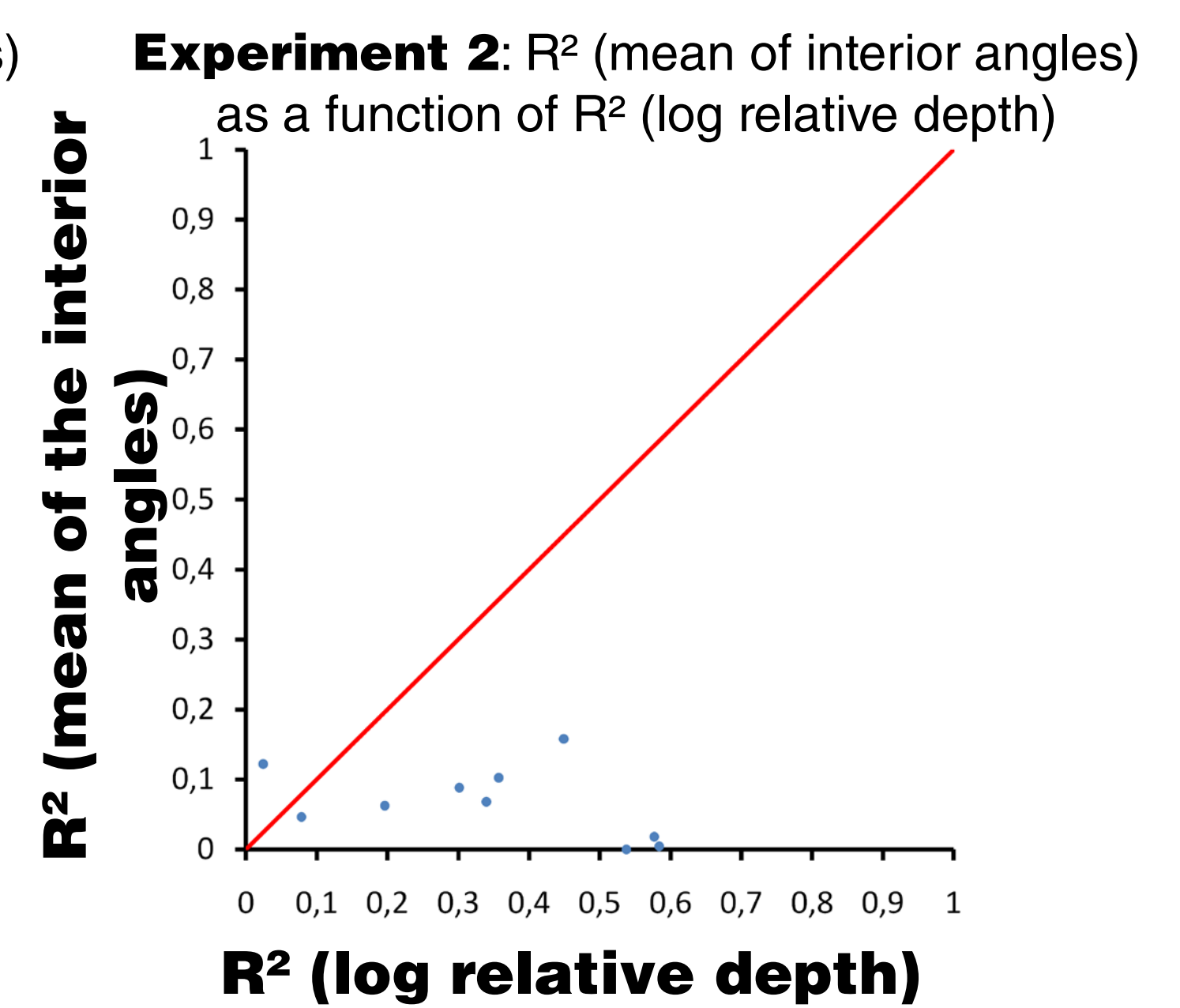
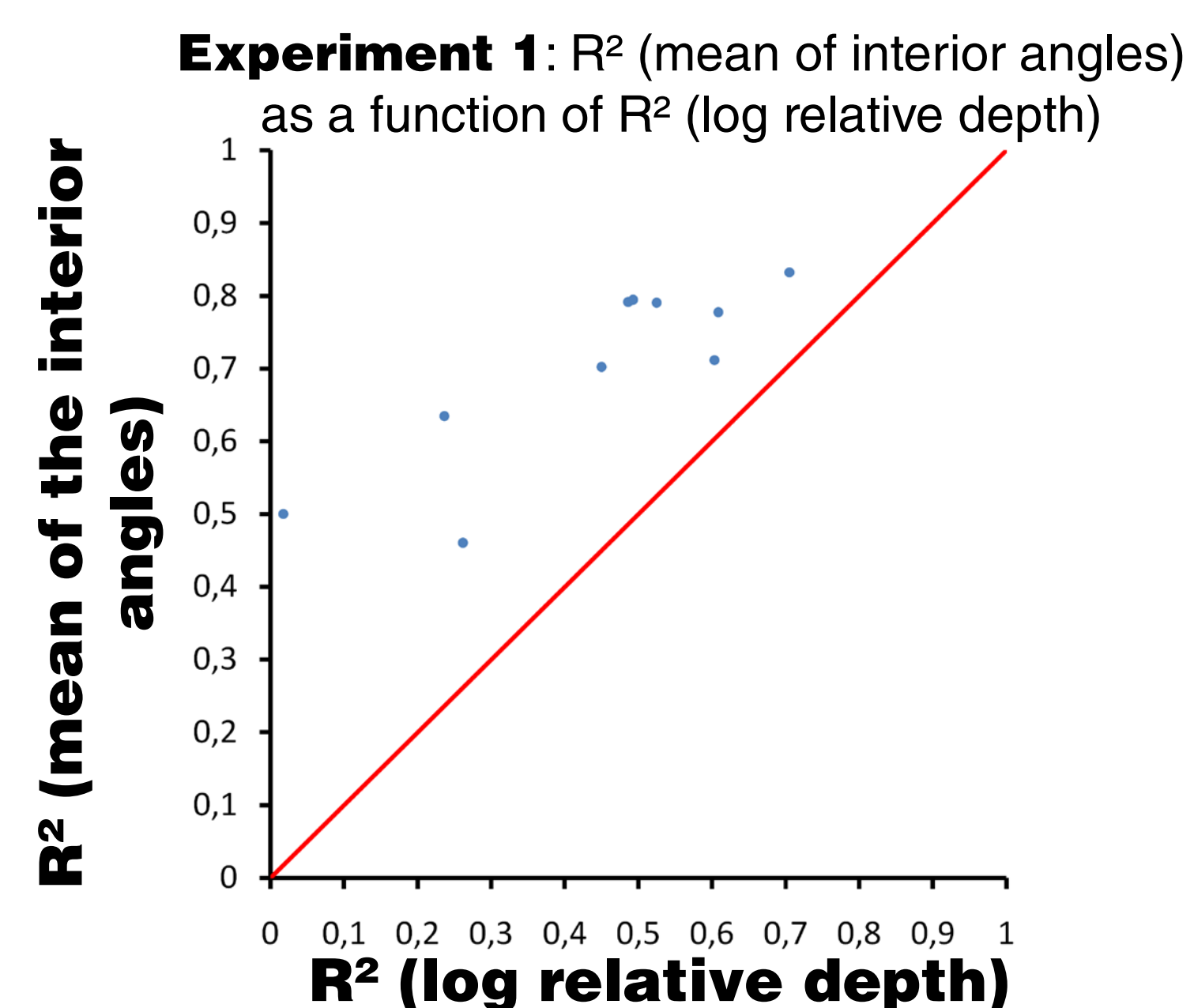
Interior angles are no longer predictive



Negative parts' relative depth predicts ‘bites’



Mean of interior angles loses predictive power when uncorrelated with relative depth



Conclusion

Our data show that subjects are good at inferring the causal history of unfamiliar ‘bitten’ 2D shapes. On a between subject basis the relative depth of a negative part is a good predictor of the subjects’ judgements.