HCI: GESTALT PRINCIPLES

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First, the news…

- https://www.youtube.com/embed/videoseries?list=PLC0A3CAC7B3A0E288

Coursework 2

- Build a website to help students new to the School of Informatics
- Groups of size 1-4
- Everybody must build a website and do some sort of evaluation to show that it is usable
- You may use tutorials to help you
  - Affinity diagram
  - Co-design
  - Evaluation session

Fitts' Law (Fitts, 1954)

- Fitts' Law predicts that the time to point at an object using a device is a function of the distance from the target object & the object's size.
- The further away and the smaller the object, the longer the time to locate it and point to it.
- Fitts' Law is useful for evaluating systems for which the time to locate an object is important, e.g., a cell and smart phones, a handheld and mobile devices.

Fitts' Law

- $T = k\ log_2(\frac{D}{S}) + 1.0$
- Where
  - T = Time to move the pointer to the target
  - D = Distance between the pointer and the target
  - S = Size of the target
  - k is a constant of approximately 200ms/bit

Gestalt Principles

- Proximity
- Similarity
- Continuity
- Closure
- Symmetry
- Figure/Ground
- Common Fate

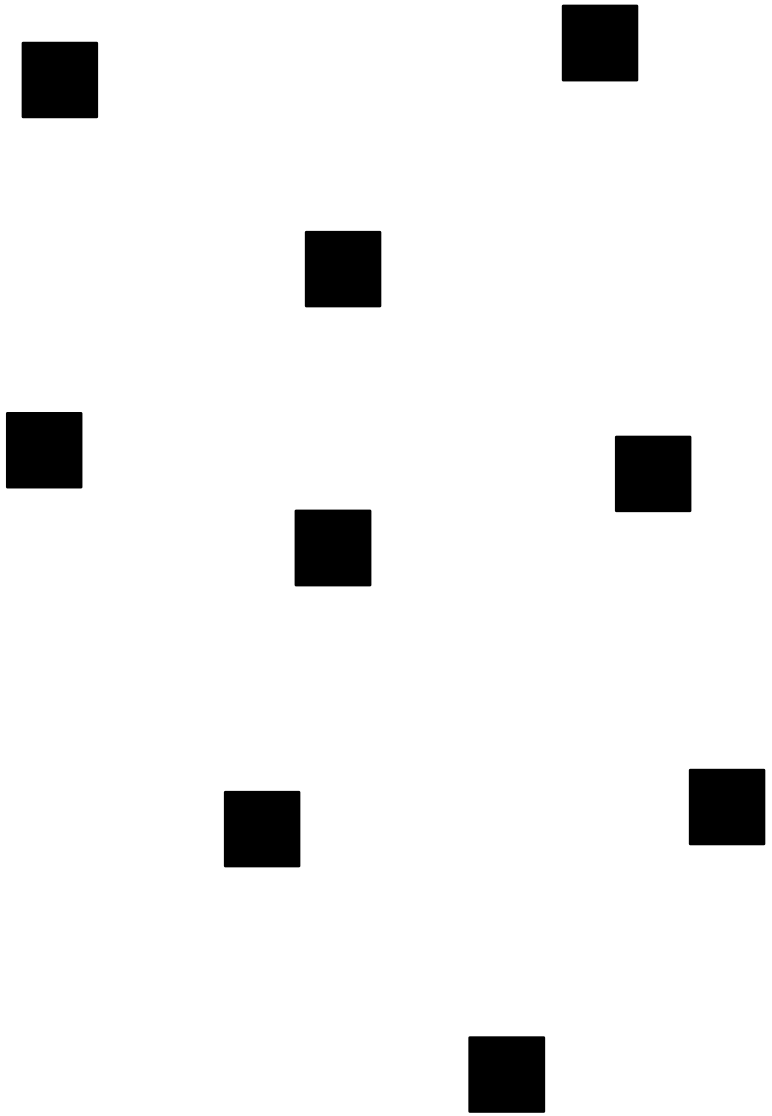
Gestalt is the German word for “shape” or “figure”

Proximity

- The relative distance between objects in a display affects our perception of whether and how objects are organized into sub-groups.

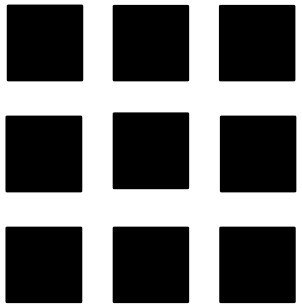
Proximity

Boxes should appear unrelated to each other



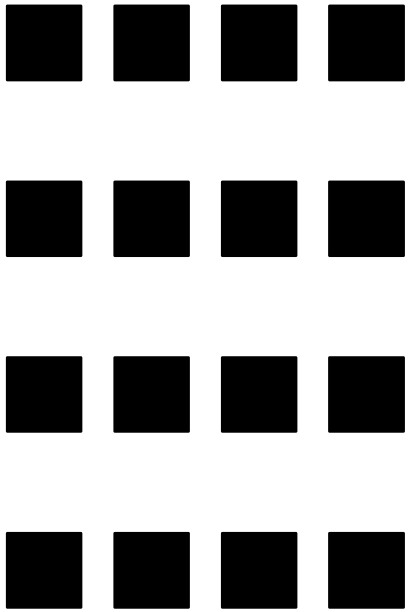
Proximity

Boxes should now appear to be a group



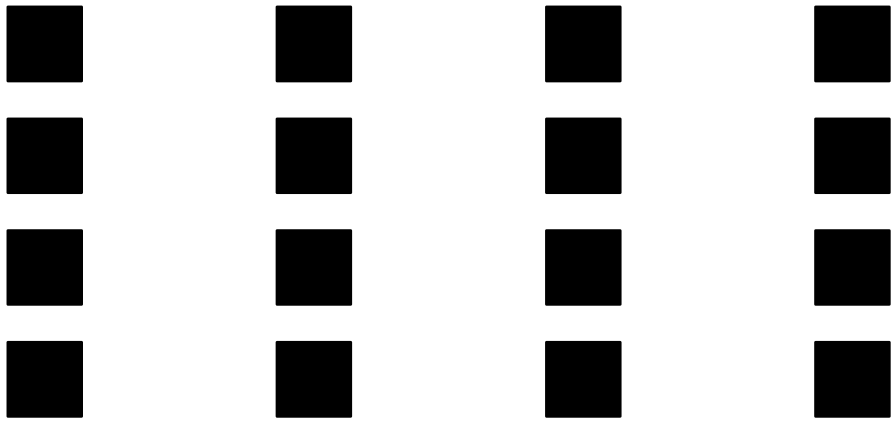
Proximity

Boxes should now appear to be grouped by row



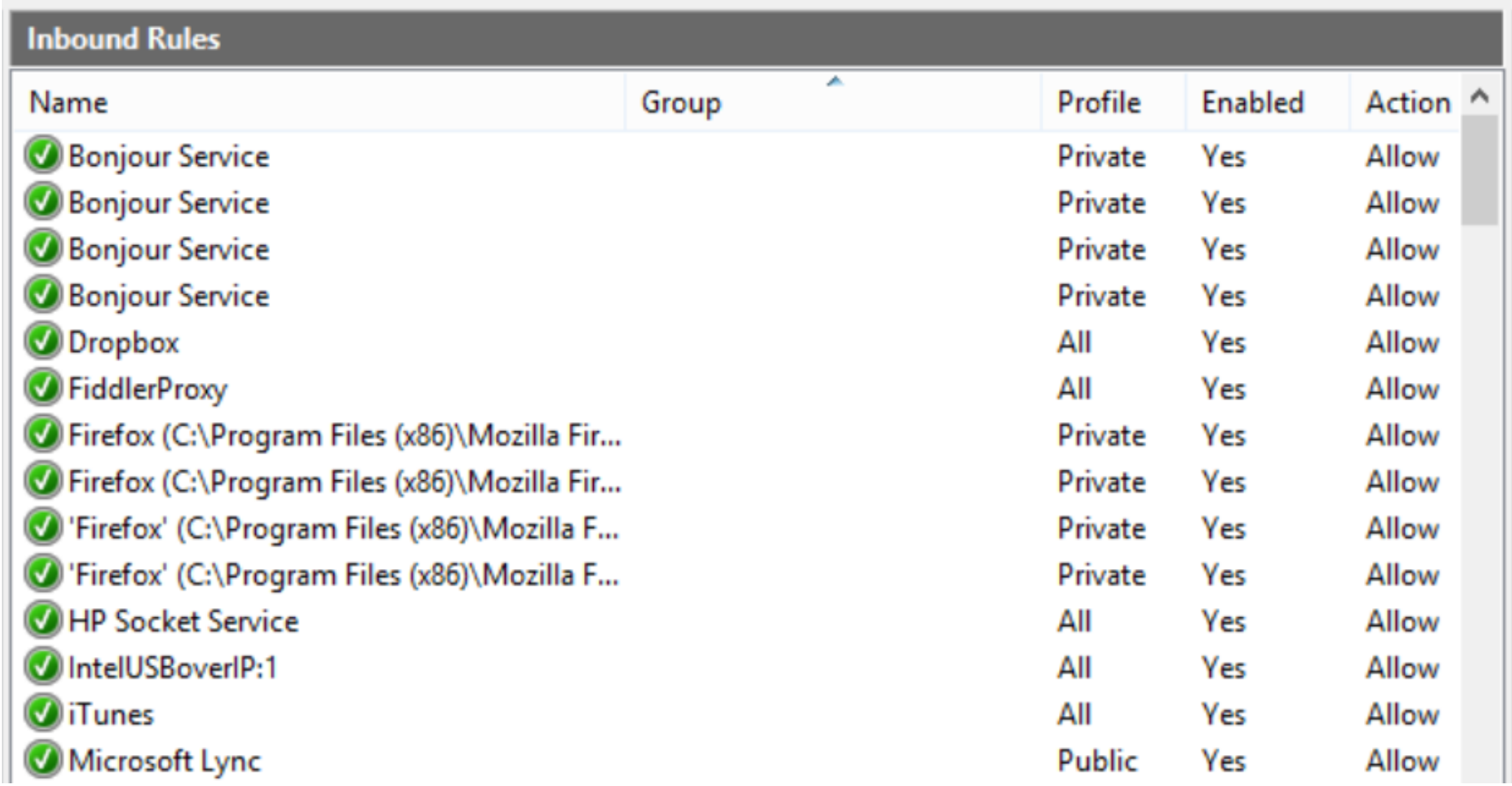
Proximity

Boxes should now appear to be grouped by column



Proximity

- UI designers want to group similar things. This firewall policy

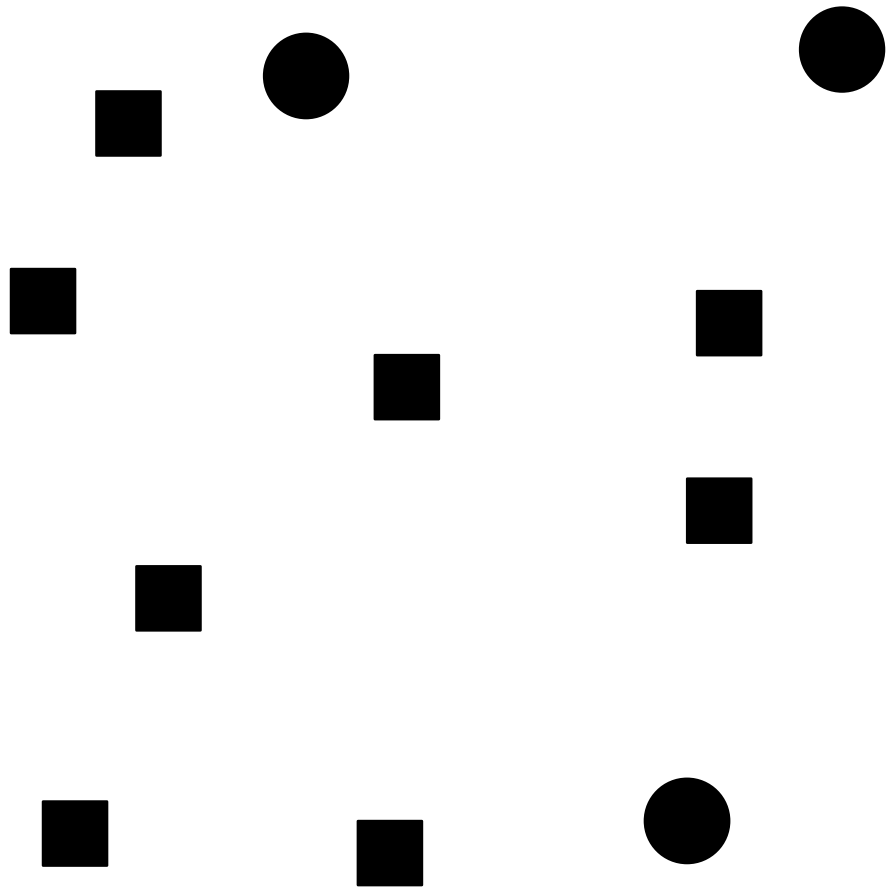


Similarity

- Objects that look similar appear grouped.

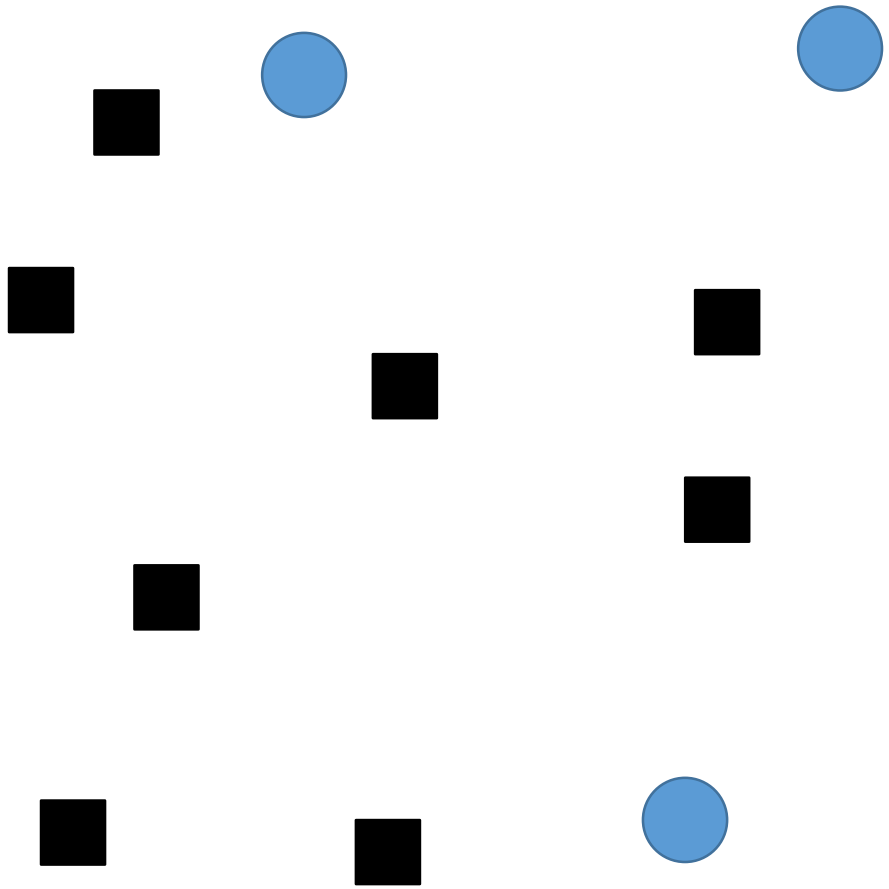
Similarity

Your brain naturally tries to put circles in one group and boxes in another



Similarity

Circles should look very grouped now



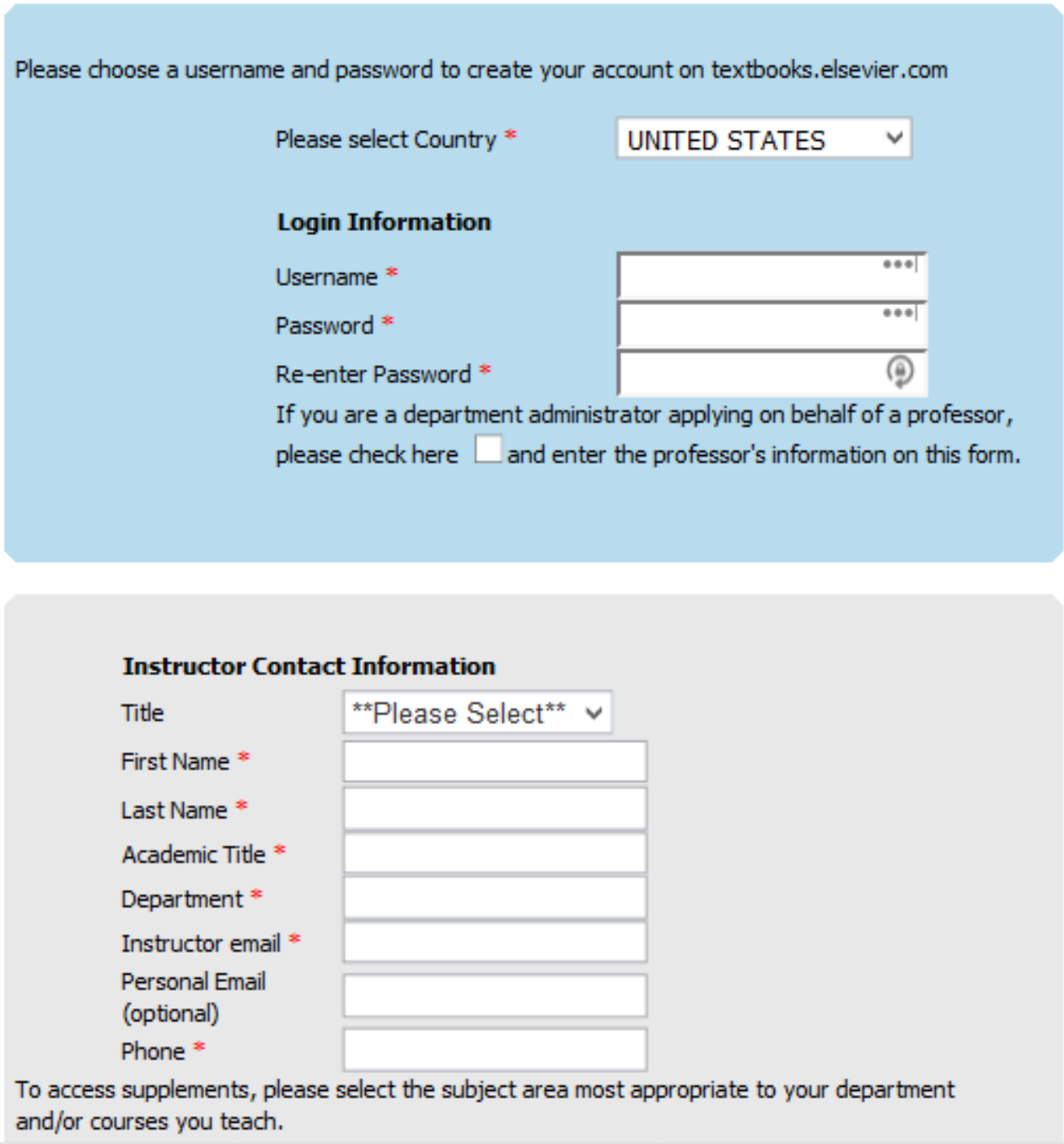
Similarity

Same story with the stars, they different looking ones should appear grouped

Similarity

Text boxes all look similar which is good.

Proximity a bit far on top box

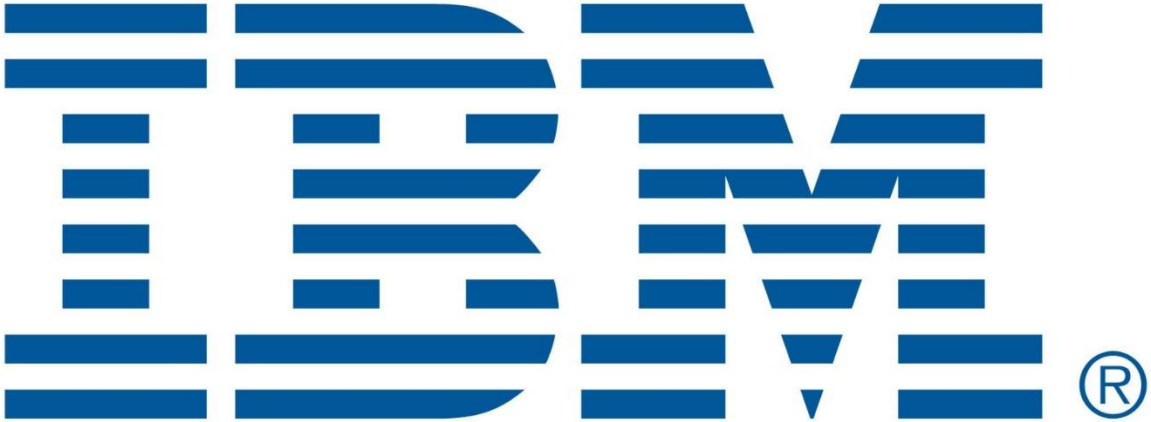


Continuity

- We resolve ambiguity by adding in missing data in such a way that we perceive whole objects. We are biased towards perceiving continuous forms rather than disconnected pieces.

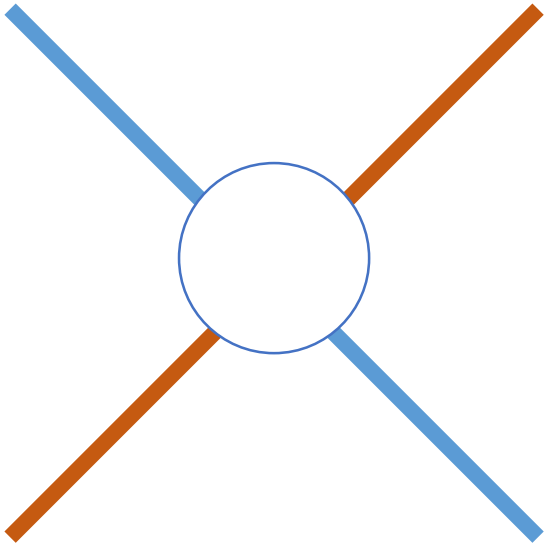
Continuity

Is this 40 lines?
Or is it the
letters IBM?



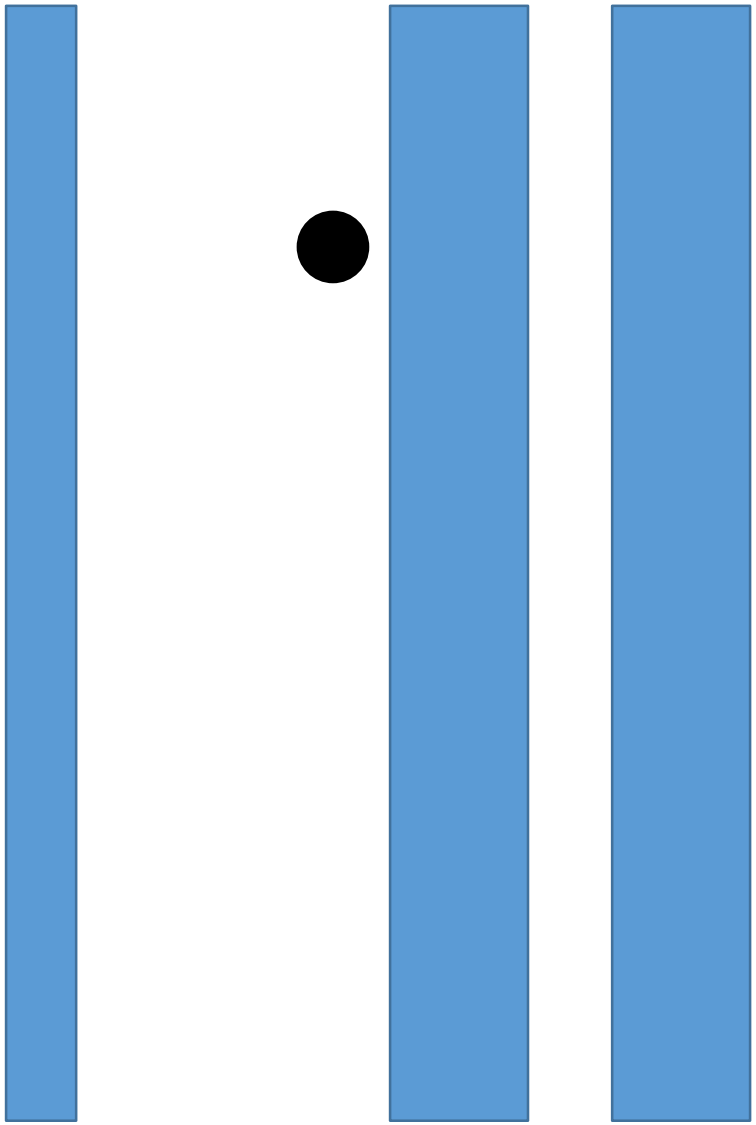
Continuity

Your brain fills in the gaps to create whole structures.



Continuity

The ball vanishes behind the lines but you still perceive it as a single object.



Continuity

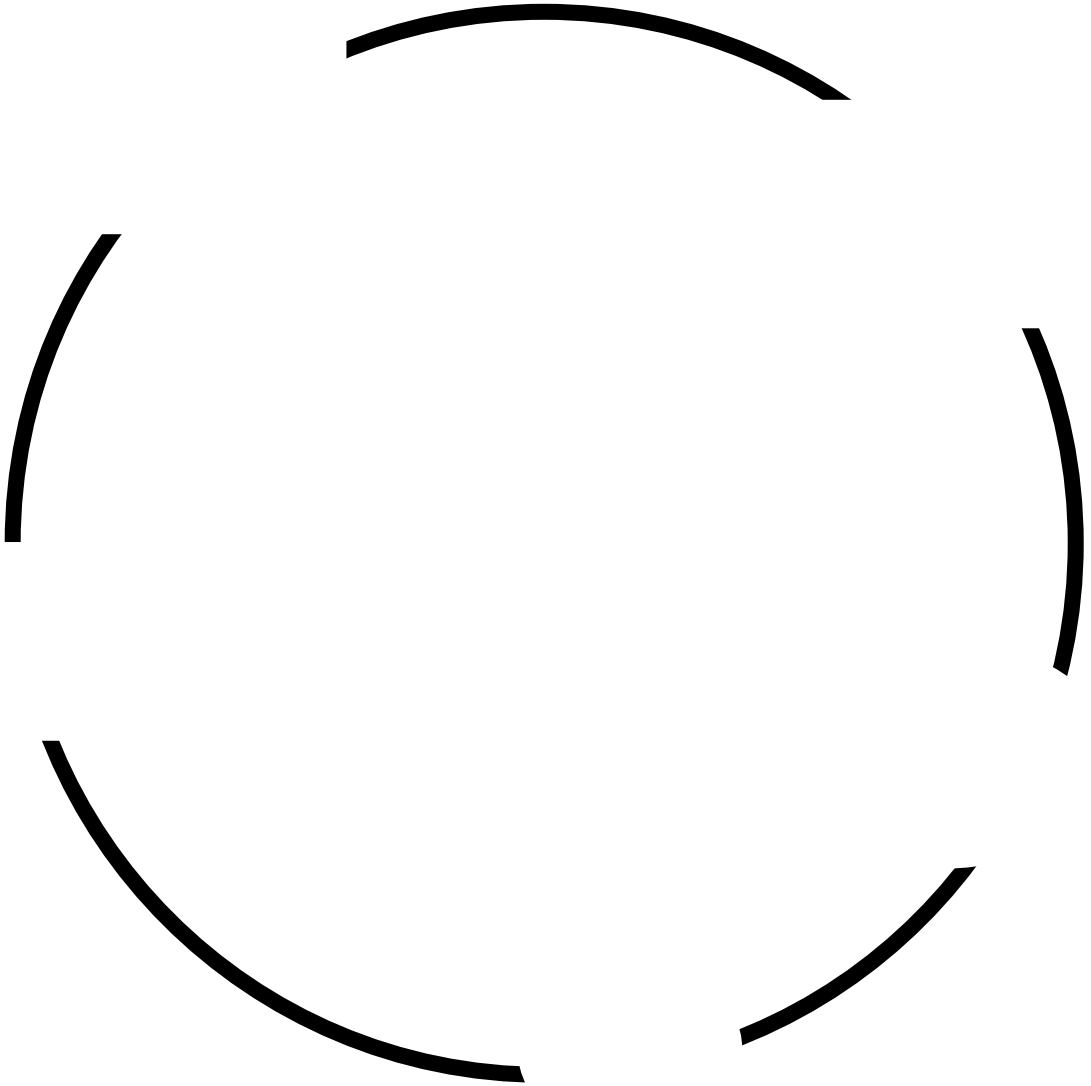
Closure

- We automatically try and close open figures so they are seen as whole objects rather than bits of line.

Closure

What shape is this?

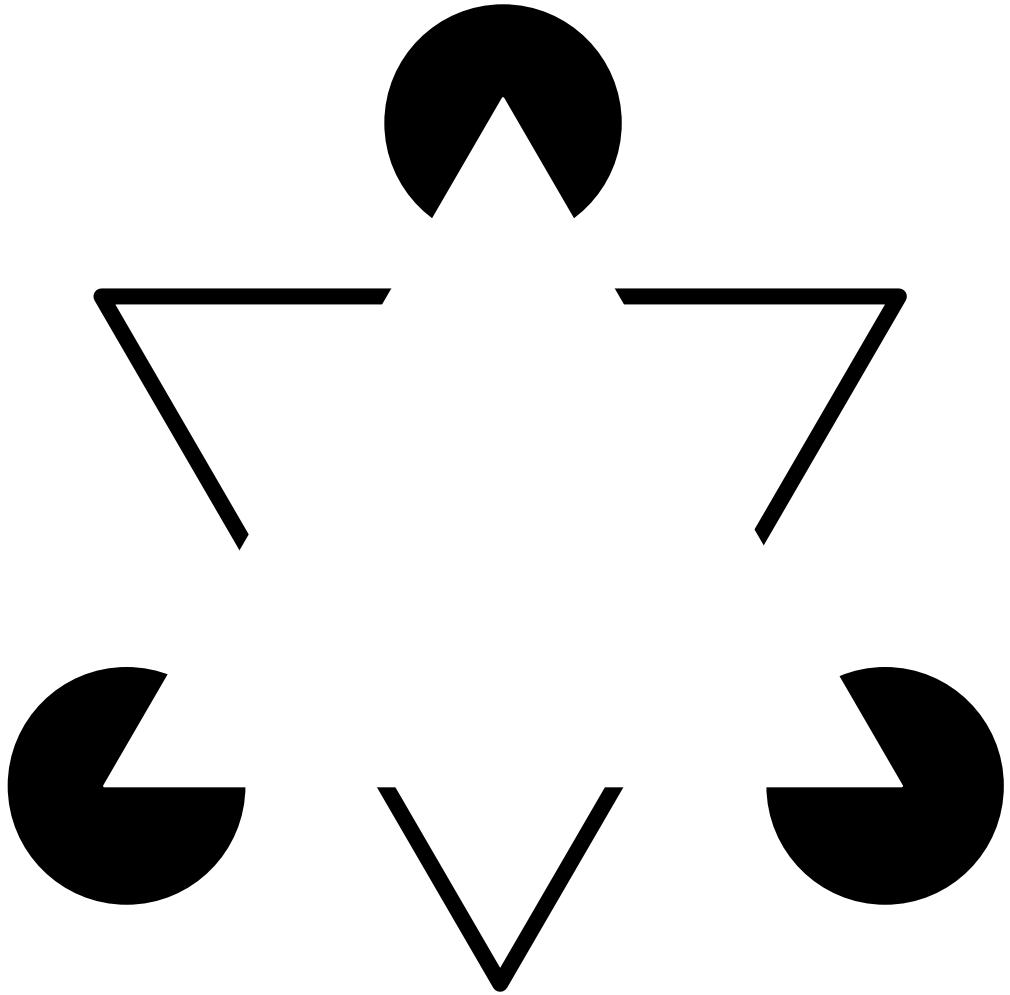
Try and make your brain see 5 lines.



Closure

What shapes do you see?

One of the shapes doesn't even have any ink representing it.

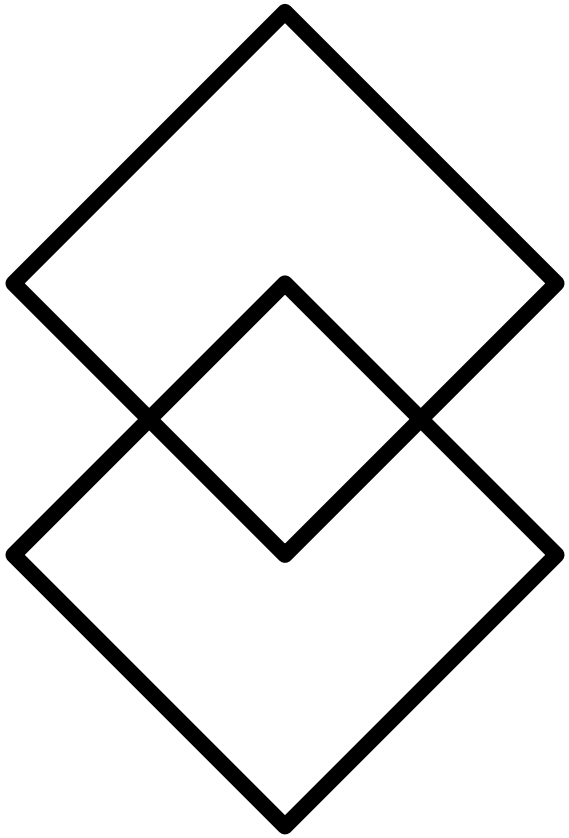


Symmetry

- We tend to parse complex images in a way that reduces complexity. Even if there are multiple interpretations, our brain tries to pick the simplest one.

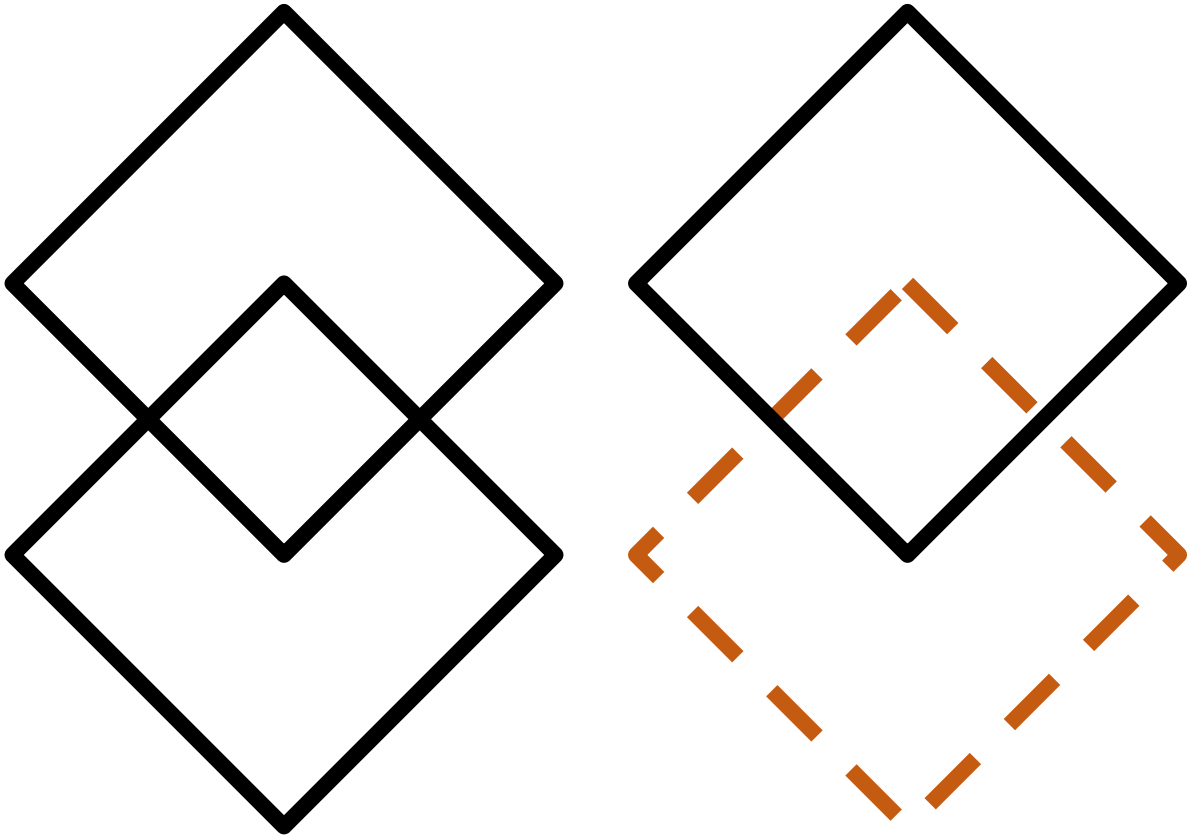
Symmetry

What does this shape look like to you?



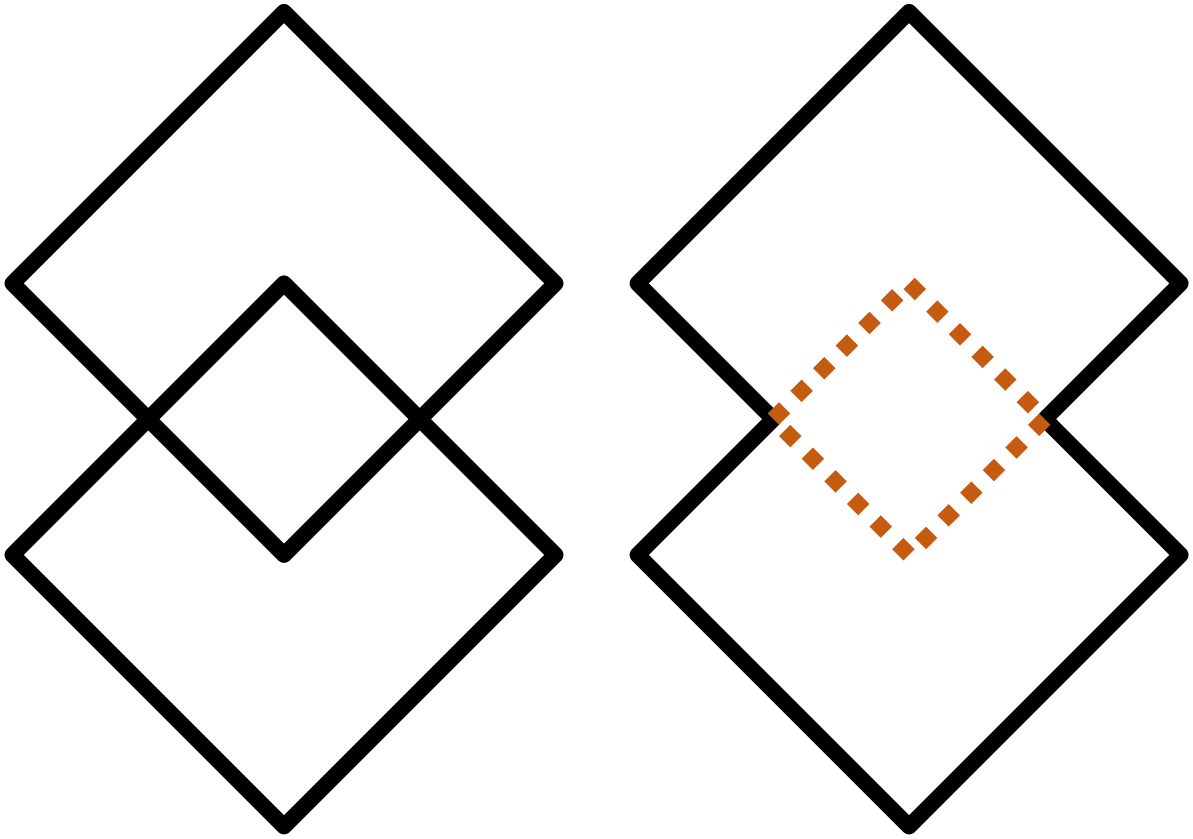
Symmetry

Most people probably saw two rectangles overlapping.



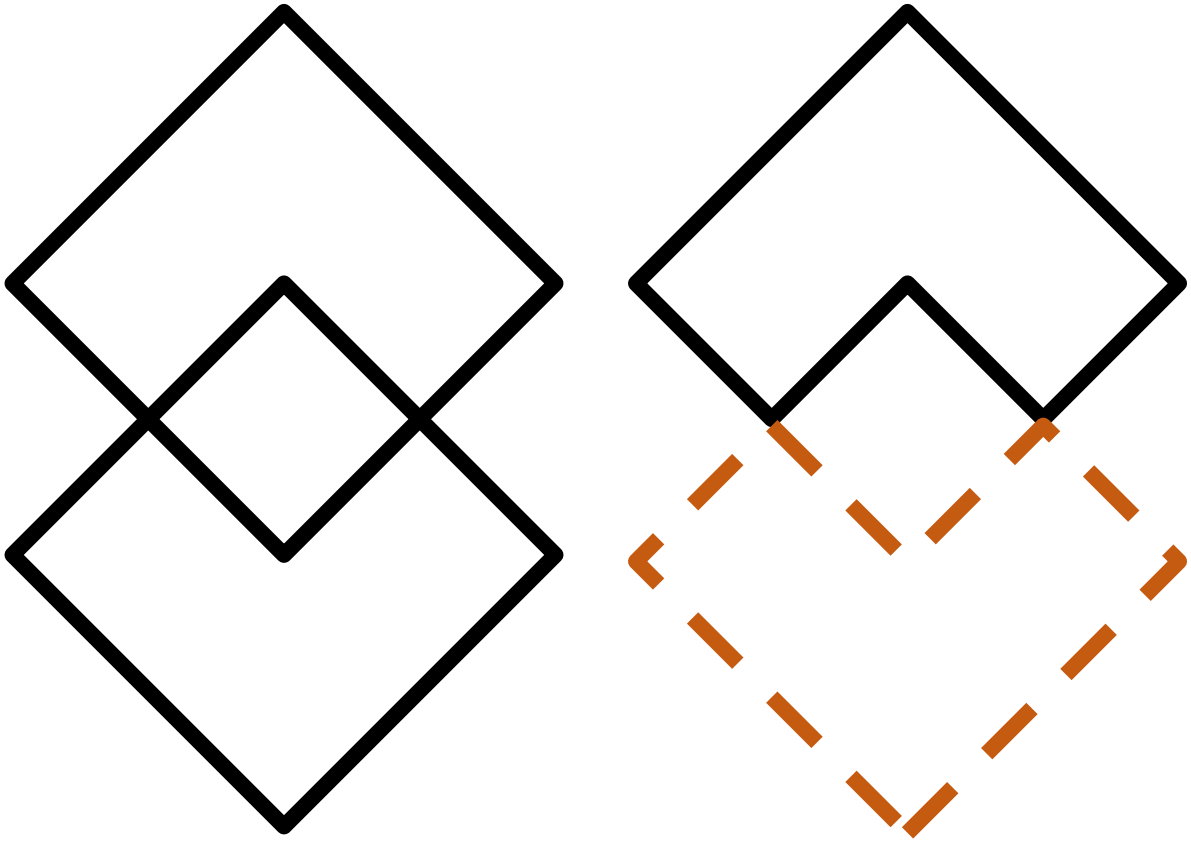
Symmetry

It could be a small rectangle overlapping a more complex shape



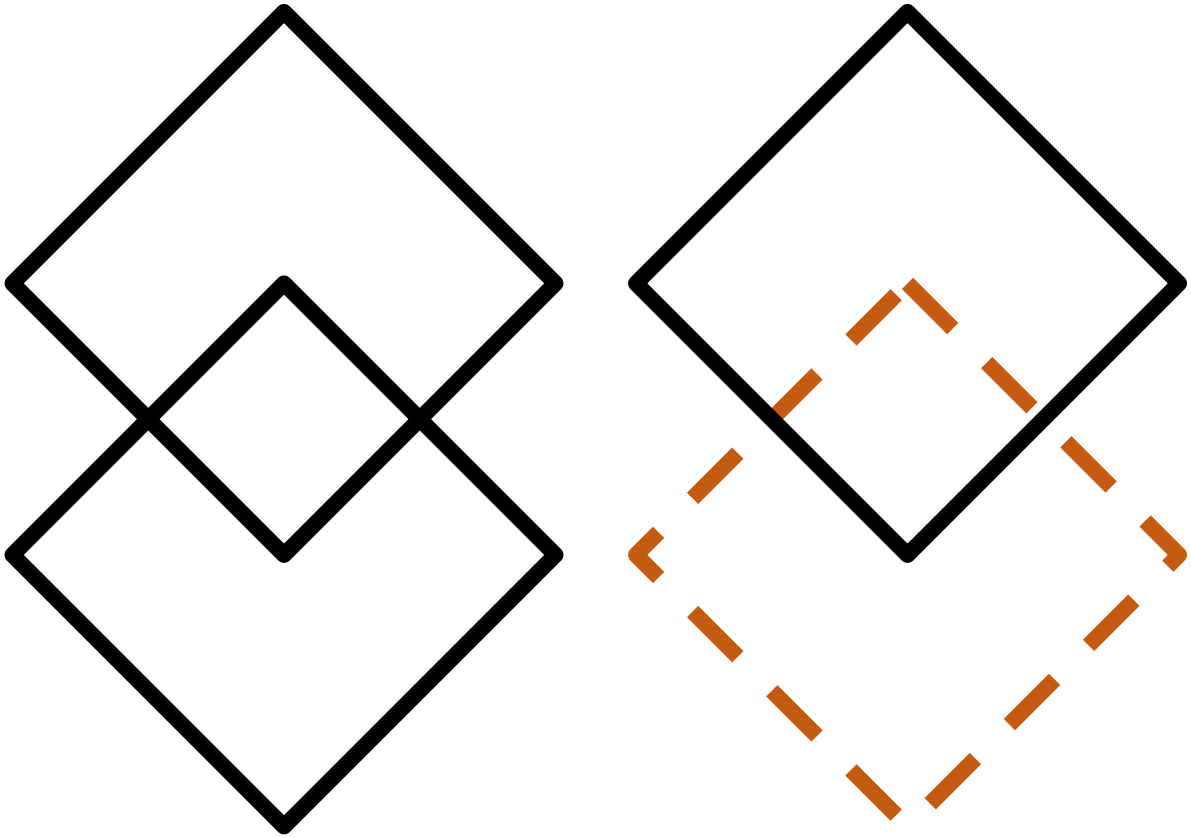
Symmetry

It could be two L shaped angles



Symmetry

Our brains like simplicity, so we are most likely to pick two overlapping rectangles

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Figure/Ground

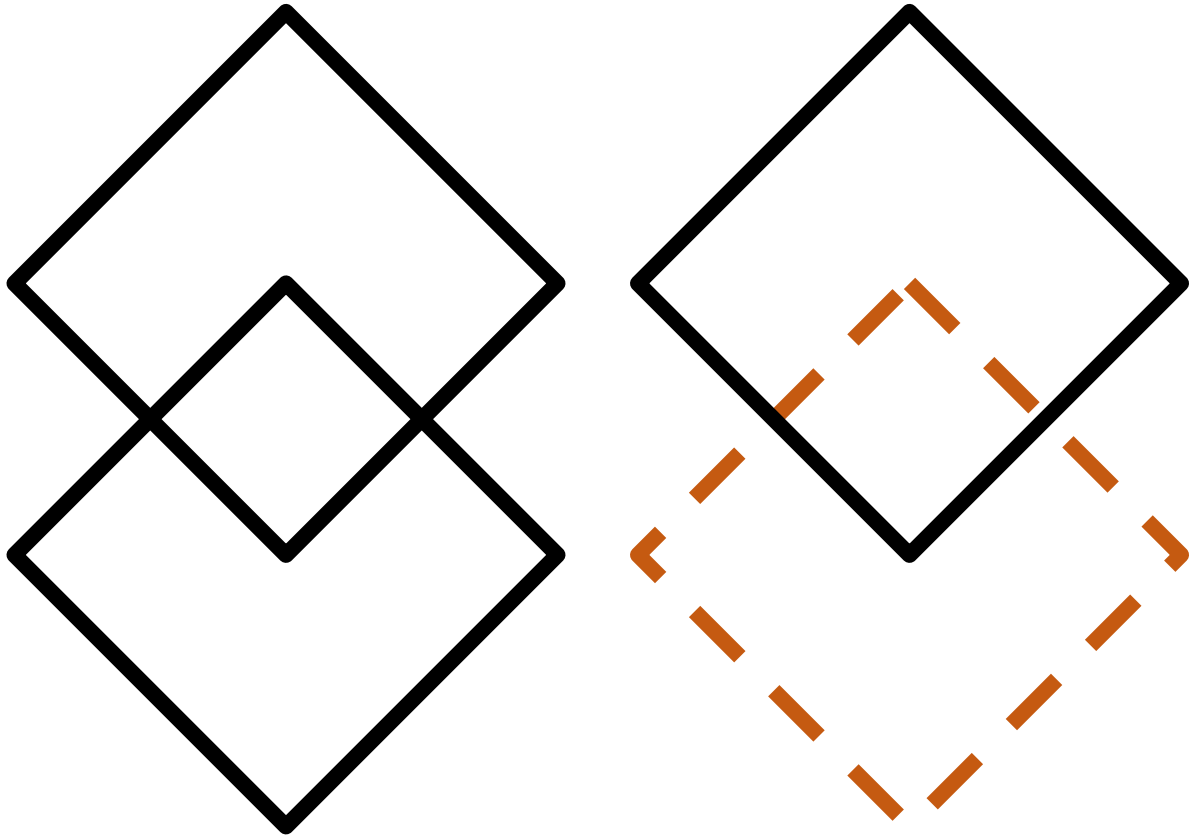
- Our brains try and separate images into a foreground and a background.

Figure/Ground

M. C. Escher is one of the more famous artists to use this principle

Figure/Ground

This image is also an example of figure/ground, your brain naturally picks one as the foreground and one as the background



Figure/Ground

Bigger image looks like background, and smaller image looks like forground

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Kami Vaniea
@kaniea

TWEETS	FOLLOWING	FOLLOWERS
1,144	223	308

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This is how you grow a perfect pumpkin: bit.ly/2eHhgXn

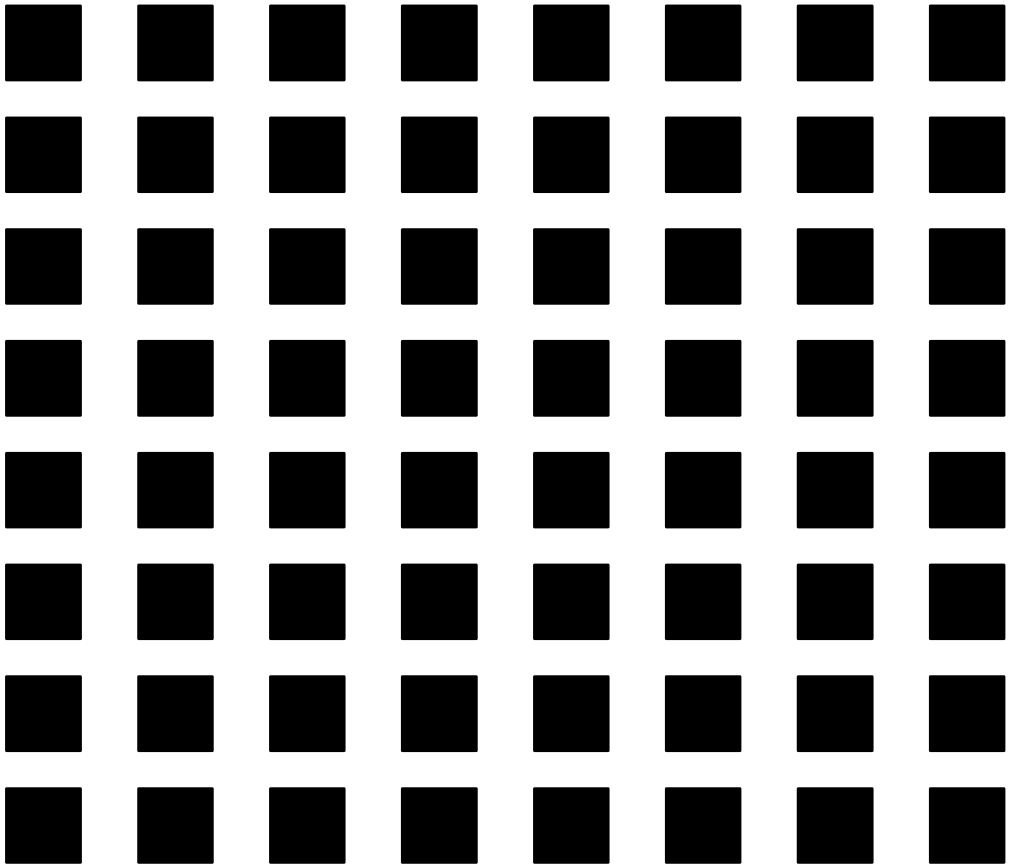
4 3

Common Fate

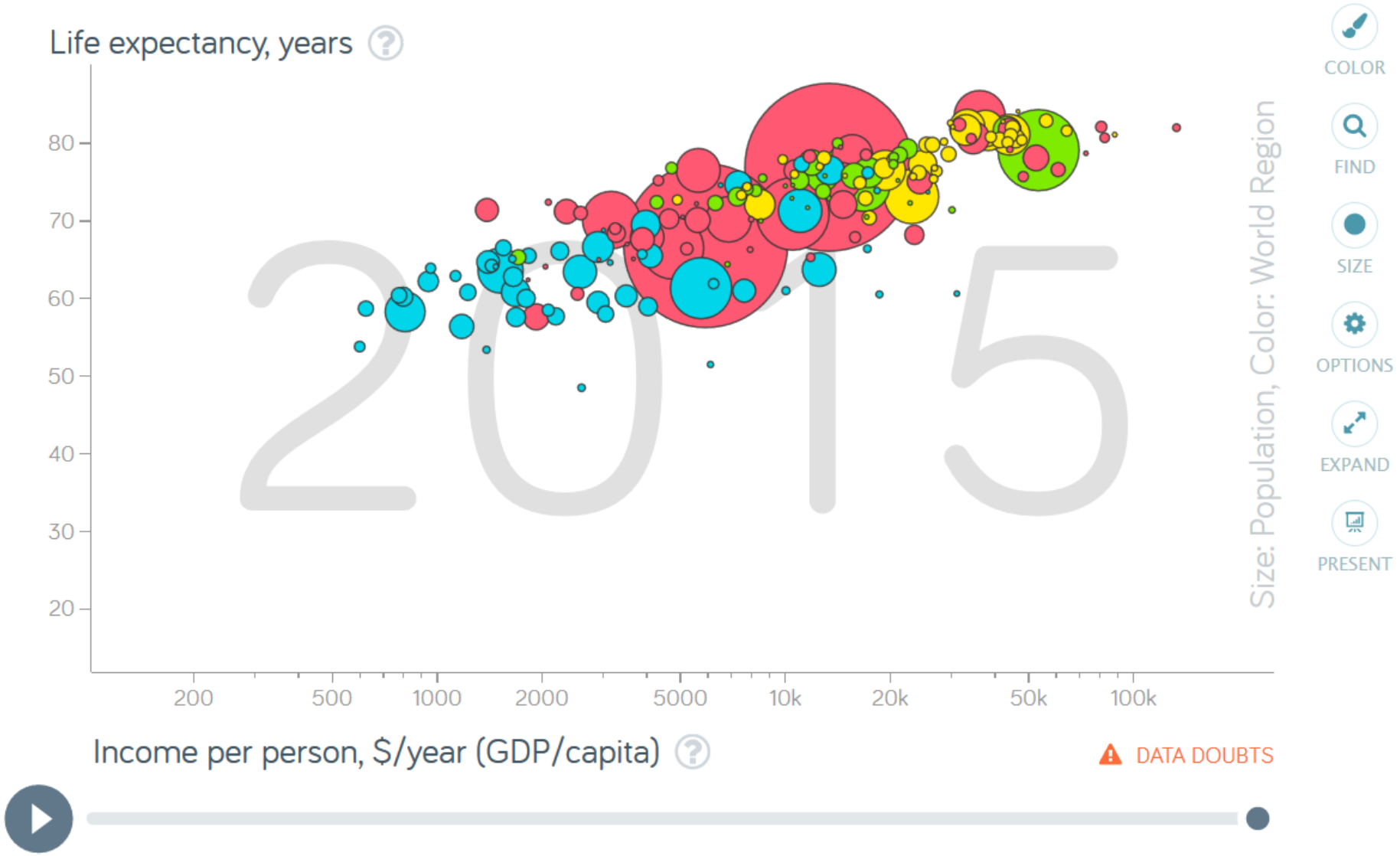
- Similar to proximity and similarity, but concerning moving objects. Things that move with similar patterns are seen as grouped.

Common Fate

Boxes that move together naturally seem grouped

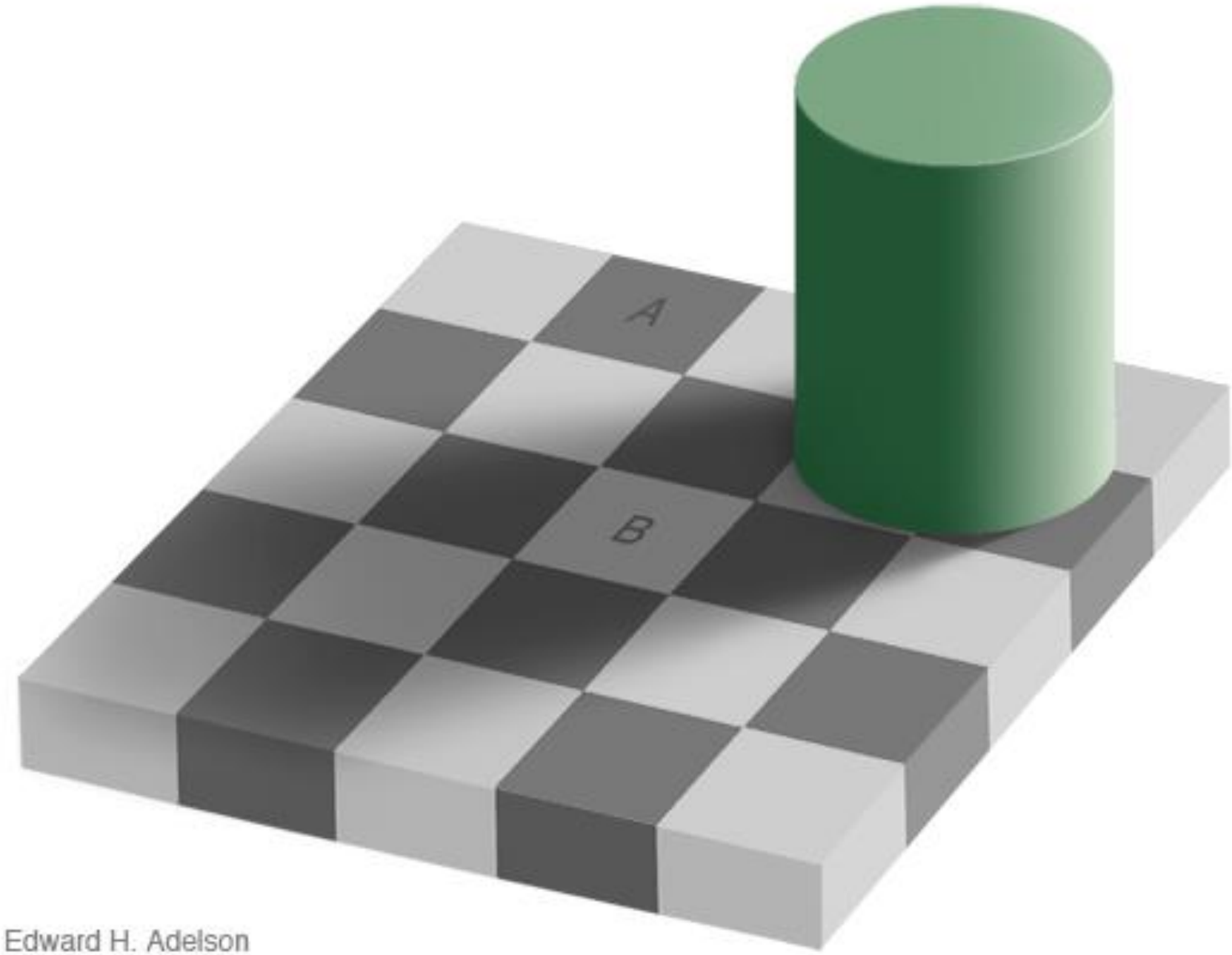


Principles often happen together

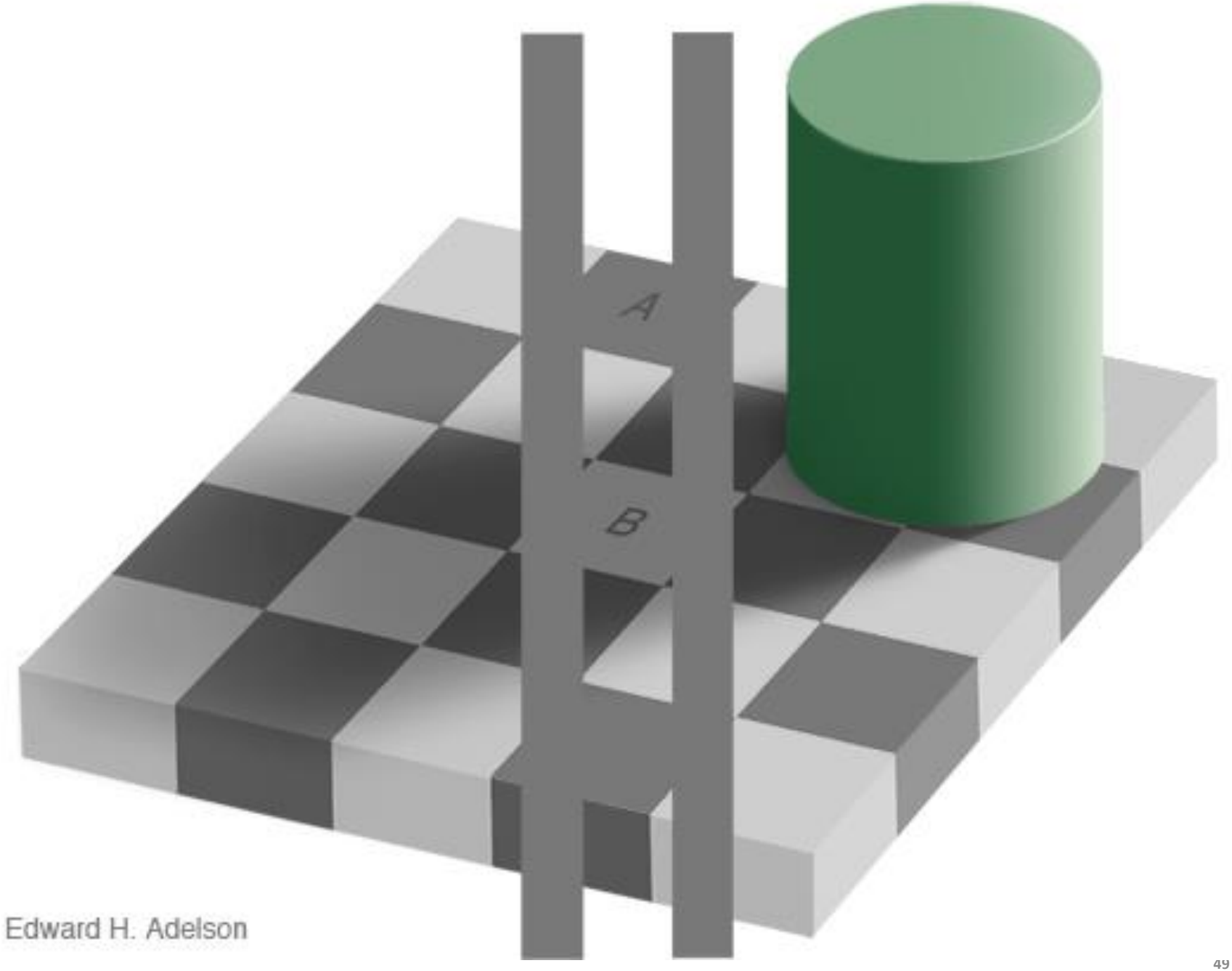


https://www.gapminder.org/tools/#_chart-type=bubbles

Just for fun



http://web.mit.edu/persci/people/adelson/checkershadow_illusion.html



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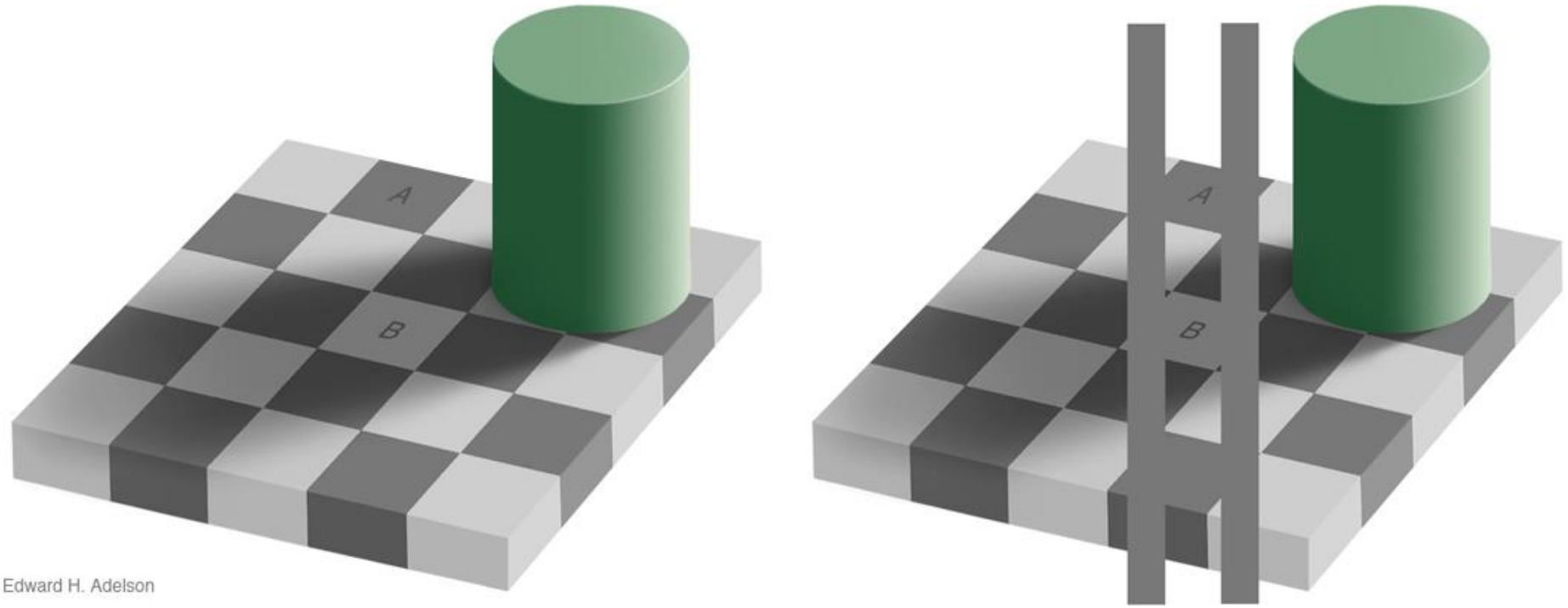

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Questions?