

Head-shrinking illusion!

(Scotland, UK)

Background

If your audience watch a continuously rotating spiral, the motion detectors in their eyes become adapted to that motion. Then, when they look at your head it will seem to grow or shrink, depending on the direction of rotation of the spiral.

You will need...

- ✓ Spiral pattern disk
- ✓ Stiff card
- ✓ Variable-speed electric drill (works well because it can be reversed)
- ✓ Machine bolt (e.g. 8 to 10 cm in length) and matching nut or wingnut, plus two large washers to hold the card on the bolt.

Follow these steps

1. Stick the spiral pattern to the card. Trim it to form a circle.
2. Make a hole in the centre of the card and mount it on the bolt between the two washers and held tightly in place by the nut or wingnut.



3. Insert the free end of the bolt into the drill and tighten the chuck to hold it in place.
4. Once you start rotating the disk get the audience to look at the spinning spiral pattern for 60 seconds.
5. Then ask them to immediately focus their gaze at your head and not the effect.
6. Repeat this with the disk rotating in the opposite direction.

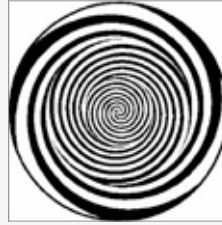
Alternative version

Mount the spiral disk on a short pencil and use it like a spinning top..

So what happened?

Some nerve cells in the visual cortex fire more when objects move outward from the centre of your field of view, and others fire more when objects move inward.

When you're looking at something that's standing still, the inward and outward channels are in balance with one another; they send equally strong signals to your brain. When you stare at this moving pattern, however, one detector channel adapts and its response is reduced. Then, when you stare at



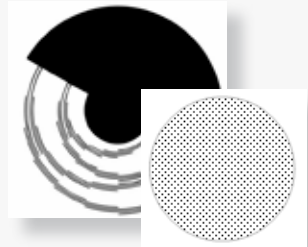
the person, the detector that hasn't been working sends a stronger signal to your brain than the adapted one does. If, for example, the spiral seemed to be moving inward,

the audience will think your head is expanding. If you rotate the spiral in the other direction, so that it seems to be moving outward, the audience will think your head is shrinking!

Very funny experience!

What next?

Try Benham's Disk which is a black and white disk that produces the illusion of colour, or the 'squirming palm disk'.



See <https://www.exploratorium.edu/snacks/benham-disk> for the patterns to print for your disks.

For more examples see: <https://www.youtube.com/watch?v=kqPGHE4Ubew>