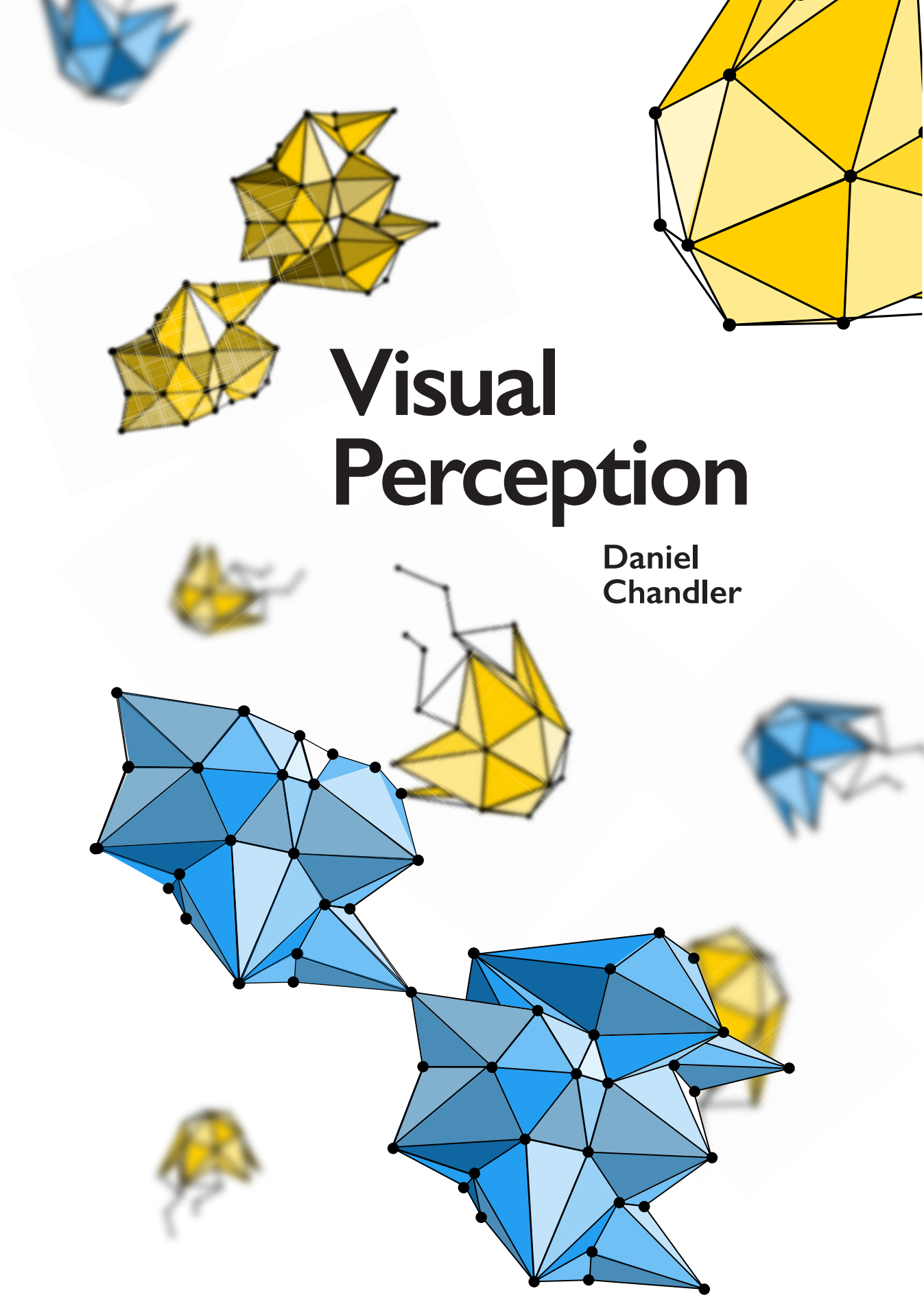
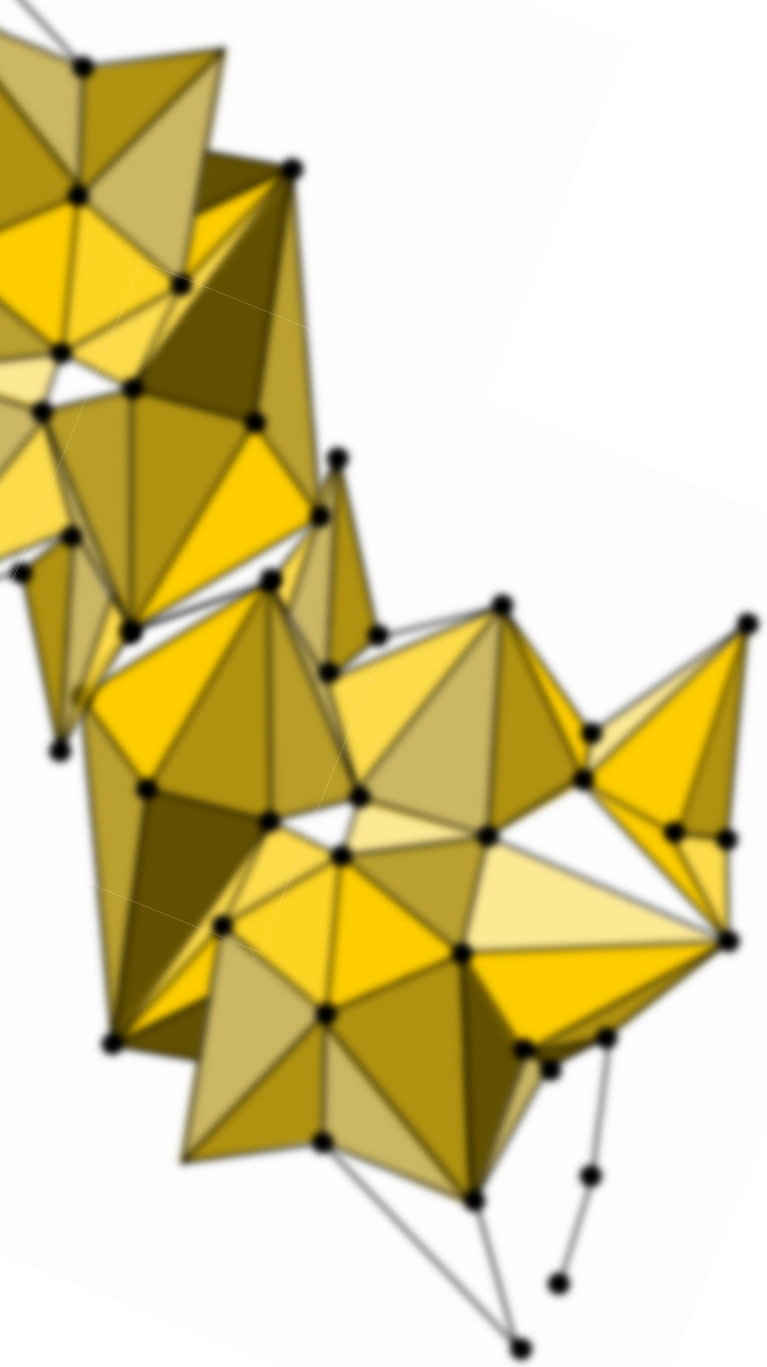


Visual Perception

Daniel Chandler



Searching for Patterns

This discussion of visual perception is part of an introduction to media theory. The prime concern here is with how mediated our experience of the world is. The study of visual perception offers considerable evidence that the world or the image is not 'given', as people sometimes say, but constructed. In visual perception we are not like passive cameras, and even the idea that the mind takes selective 'snapshots' underplays our active interpretation of the world.

The Distinctiveness of Human Vision

It is worth reminding ourselves that 'the world' which we often regard as objectively 'out there' is experienced in very different ways by other creatures.

Sight dominates the way we 'see' the world. It even dominates our descriptive vocabulary. We don't know how other creatures see the world, though we do know how eyes differ in the animal kingdom and we know that different animals vary in their reliance on vision. Of course, some creatures don't 'see' the world at all. And many creatures rely far less on vision than we do (e.g. bats, dolphins). Most mammals live in more of a world of scent than of sight. We share our reliance on sight more than scent with other primates.

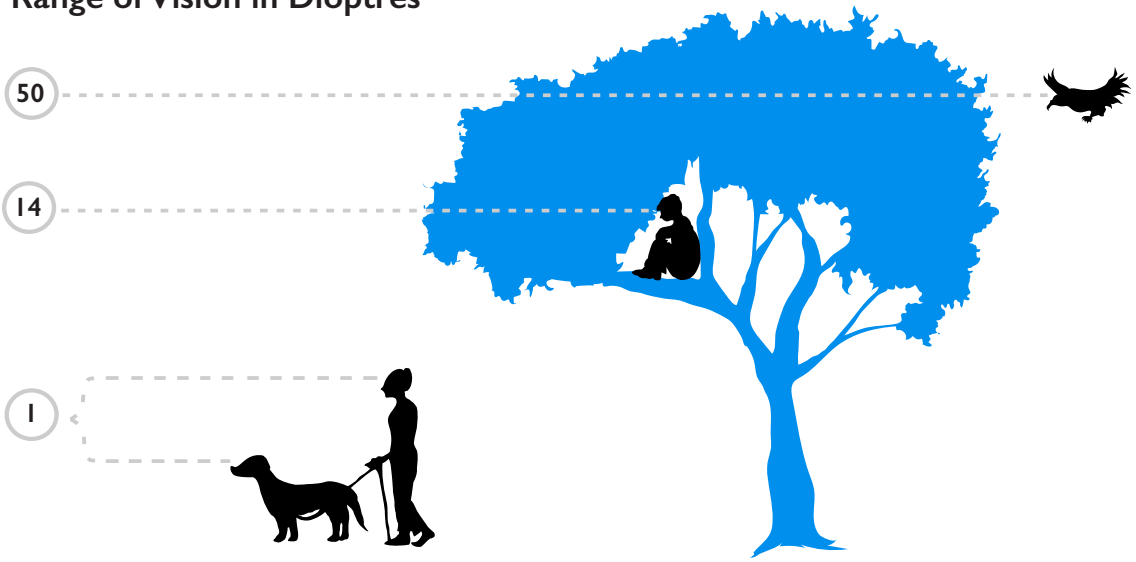
However, of all vertebrate animals, birds are the most dependent on sight.

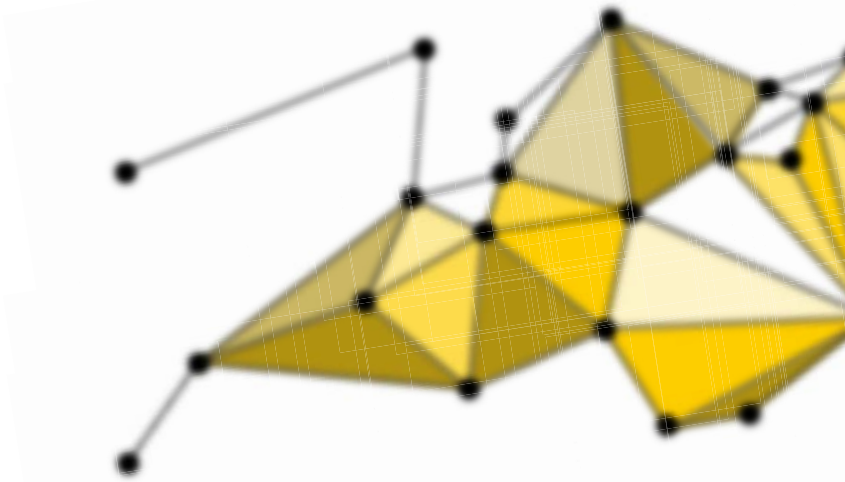
Animals differ in visual acuity. Insects are short-sighted whereas a kestrel can spot a mouse from 1.5 km up. Hawks can spot prey 8 times further away than human beings can. The range of distances that animals can focus on is measured in dioptres. We have a good focal range (or 'accommodation') compared with most mammals. A child's range is about 14 dioptres, though an old person's is about 1dioptre. Many creatures have poor accommodation or none.

A dog copes with 1 dioptre. However, diving birds have 50 dioptres- the greatest of all animals.

Most invertebrates don't need to accommodate - sight involves short focal length and great depth of field - keeping everything in equal focus (though without much fine detail). A bee can see things from an inch or so away whereas we can't focus on things much under 6 inches away (without a magnifier).

Range of Vision in Dioptres

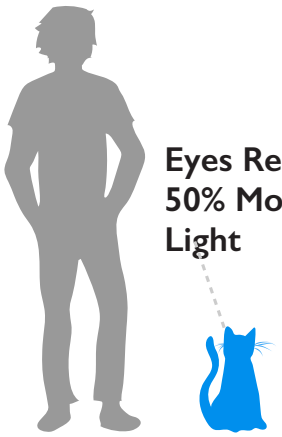


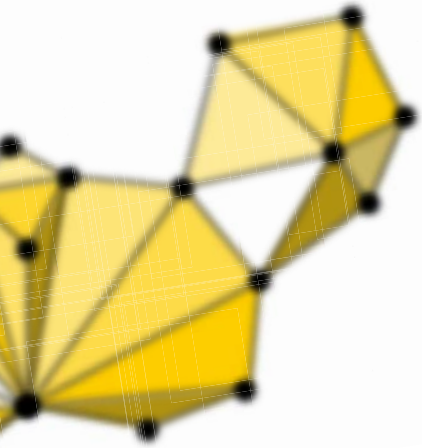


No creature sees fine detail in darkness, but some other creatures have far better 'night sight' than we do (e.g. foxes, cats and owls). Creatures with good night sight typically have the reflective 'eye-shine' that we often notice. It is this which allows them to make the most of whatever light there is.

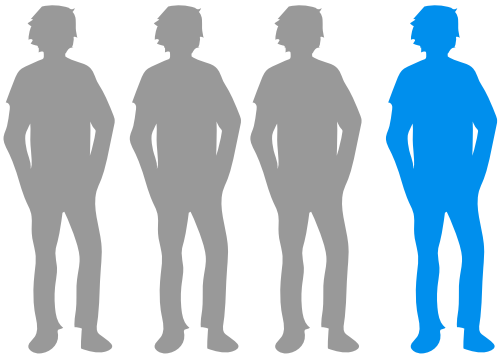
Owls have a sensitivity to low light intensities 50-100 times greater than that of unaided human night vision. Cats' eyes catch 50% more light than ours and are eight times more sensitive than ours at night. But such sight is typically supplemented by other senses. And even within vision, movement is the key for some creatures: the eyes of such creatures as the bee and the frog are very sensitive to movement.

Different creatures vary in the amount of the brain which is devoted to vision. Over half of the brain of the octopus and the squid is devoted to vision. But we still don't know how other creatures make sense of what their eyes detect. No single creature can see all that others can. We often forget that the human world of sight is only one such world.





75% of Students Reported They Would Rather Lose Other Senses to Sight



Ocularcentrism

Amongst the senses, Plato gave primacy to sight. When he decided that we had five senses, Aristotle ranked sight over hearing: 'Of all the senses, trust only the sense of sight'. Plato and Aristotle closely associated vision and reason. This has been a persistent bias in Western culture.

Thinking is associated with visual metaphors: 'observation' privileges visual data; phenomenon (Greek: 'exposing to sight'); definition (from definire, to draw a line around); insight, illuminate, shedding light, enlighten, vision, reflection, clarity, survey, perspective, point of view, overview, farsighted.

Other words associated with thinking also have visual roots: intelligent, idea, theory, contemplate, speculate, bright, brilliant, dull. And there is no shortage of commonly-used phrases which emphasize the primacy of the visual:

Seeing is believing
Let me see, I see
I'll believe it when I see it with my own eyes
Seeing eye to eye
It's good to see you
Love at first sight
What does she see in him?
In the mind's eye
Draw your own conclusions
See what I mean?

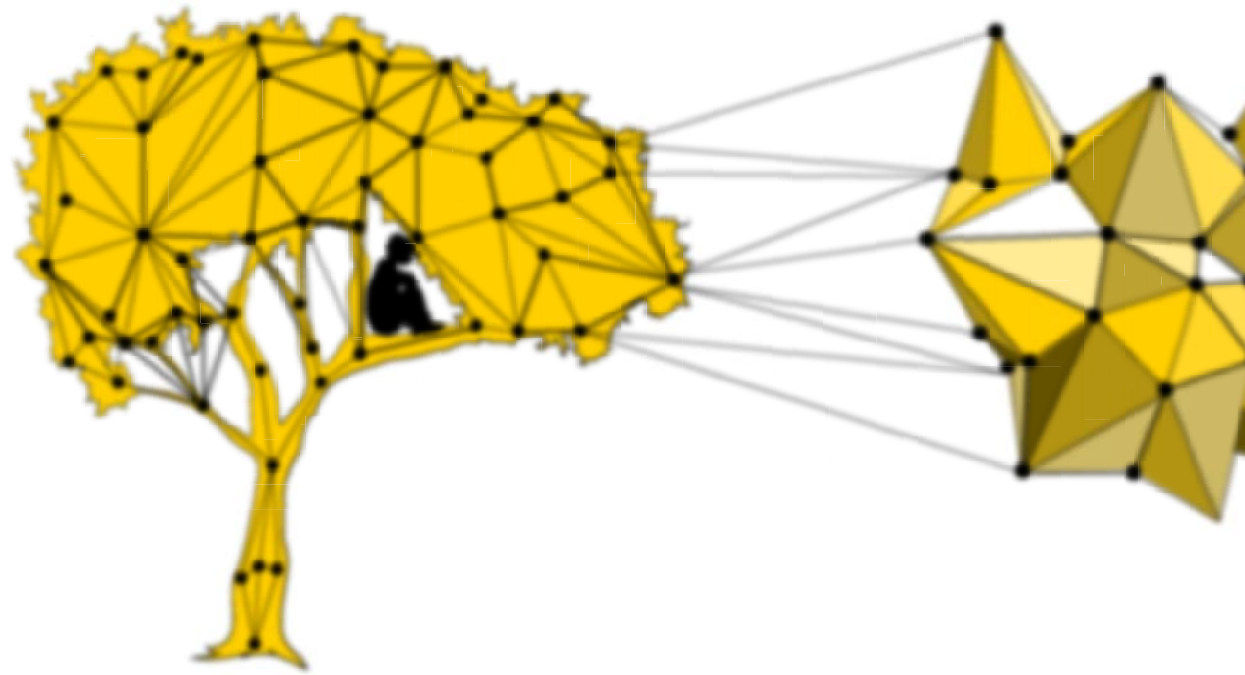
When students in one study were asked to list the sense they'd least like to lose, 75% listed sight.

It is likely that the spread of literacy in modern times has helped to privilege sight.

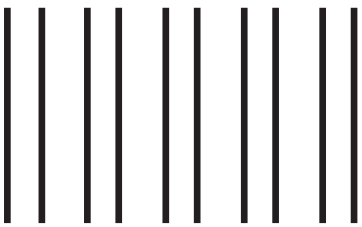
Homo Signifificans

This discussion of visual perception is part of an introduction to media theory. The prime concern here is with how mediated our experience of the world is. The study of visual perception offers considerable evidence that the world or the image is not 'given', as people sometimes say, but constructed. In visual perception we are not like passive cameras, and even the idea that the mind takes selective 'snapshots' underplays our active interpretation of the world.

Now I would like to emphasize that we seem as a species to be driven by a desire to make meanings: I suggest that we are, above all, Homo significans - meaning-makers. This fundamental concern underlies the process of human visual perception. Faced even by 'meaningless' patterns the mind restlessly strives to make them meaningful. Look at this image for a few moments.



It is hard not to start 'seeing things' in this abstract geometrical arrangement. The spacing is even, but we may start to see rows, or columns, or small groupings - such as of 4 black squares. We restlessly shift from one way of patterning to another - in this case none is likely to seem much more meaningful than another so we quickly tire of looking at such a frustrating image. (Yes, and you can see grey areas at the intersections - a point to which I will refer in a later lecture). Here is another repetitive arrangement.



Sometimes images are neither open to almost any interpretation nor constrained to a single 'preferred interpretation'. Some of the images used in the study of visual perception have been carefully designed to be interpreted in two different but specific ways. Look at the following example, for instance.

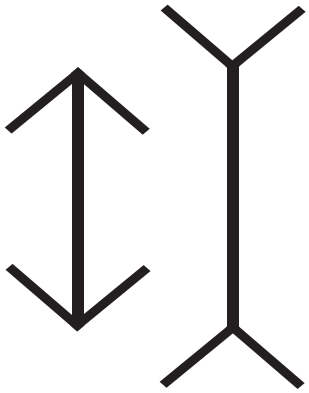
At first sight, this may seem to be either a seal or a donkey (alternatives which we would be unlikely to confuse in real life). Here, you will initially see either a seal or a donkey, but not both at once. You bring your own preferred interpretation to the image - a phenomenon known to psychologists as perceptual set (this will be discussed in a later lecture). In cases where one alternative interpretation repeatedly elicits far more support than the other, it might be said that the image itself has a preferred interpretation (though this might be culturally-specific).

This time, you are more likely to impose a particular grouping on what you see. People tend to refer to five pairs of lines which are close together with fairly broad gaps between them. You are less likely to group together the lines which are further apart, perhaps partly because this would leave lonely lines on each side of the image, but also (as we will see in a later lecture) because we seem to have a predisposition to associate things which are close together.

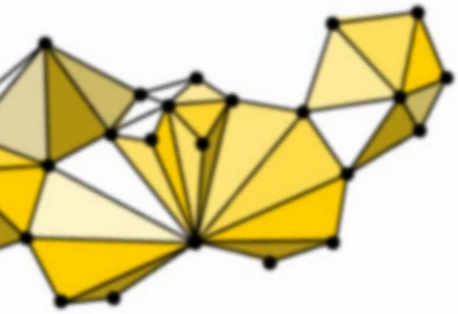
Cultural and Environmental Factors

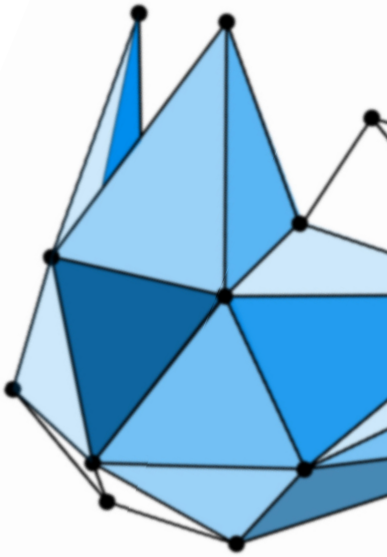
Most features of the general process of visual perception appear to be virtually universal rather than being culturally-specific. However, certain features do seem to be subject to some degree of cultural variability.

Some other optical illusions seem to be culturally variable. One example is the Müller-Lyer Illusion.



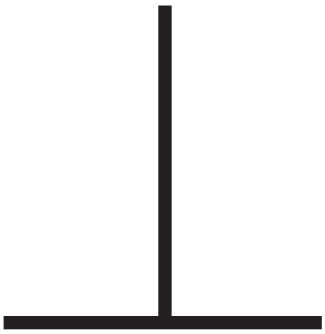
This illusion is well-known - most of us are aware that the vertical lines here are actually the same size but that the righthand line appears to be substantially longer. One explanation of why the righthand figure appears to be so much larger involves interpreting the images in depth. The righthand figure can be easily





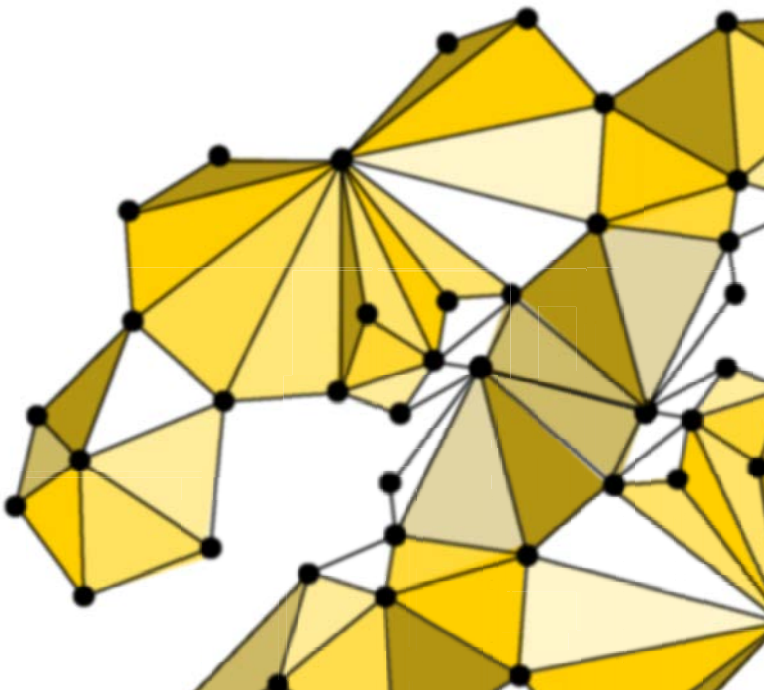
interpreted as representing the inside corner of a room whilst the arrowlike lefthand figure can be seen as the outside corner of a building. As an inside corner the righthand figure may appear to be nearer (and therefore larger) than the outside corner.

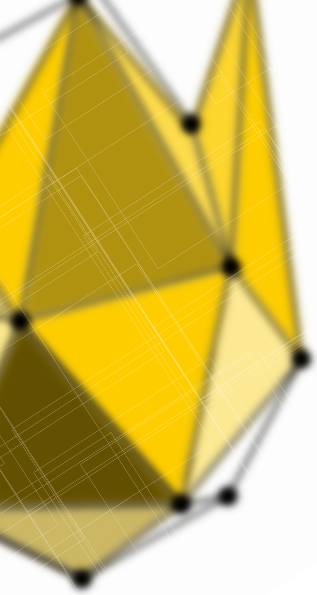
Another well-known illusion of size is called simply the 'horizontal-vertical illusion. It is shown below.



The lines are of equal length but the vertical one seems longer. This may be because the vertical line seems to recede in depth.

The illusion may be stronger for people who are familiar with straight lines receding over a considerable distance. It has been argued that people who dwell in enclosed areas such as forests who are not used to vast open spaces and who have little opportunity to see the horizon or for great distances would be less susceptible to the horizontal-vertical illusion than those with long uninterrupted views. Segall, Campbell





The anthropologist Colin Turnbull described what happened in the former Congo in the 1950s when a BaMbuti pygmy, used in living in the dense Ituri forest (which had only small clearings), went with him to the plains:

And then he saw the buffalo, still grazing lazily several miles away, far down below. He turned to me and said, 'What insects are those?'

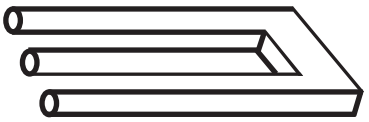
At first I hardly understood, then I realized that in the forest vision is so limited that there is no great need to make an automatic allowance for distance when judging size. Out here in the plains, Kenge was looking for the first time over apparently unending miles of unfamiliar grasslands, with not a tree worth the name to give him any basis for comparison...

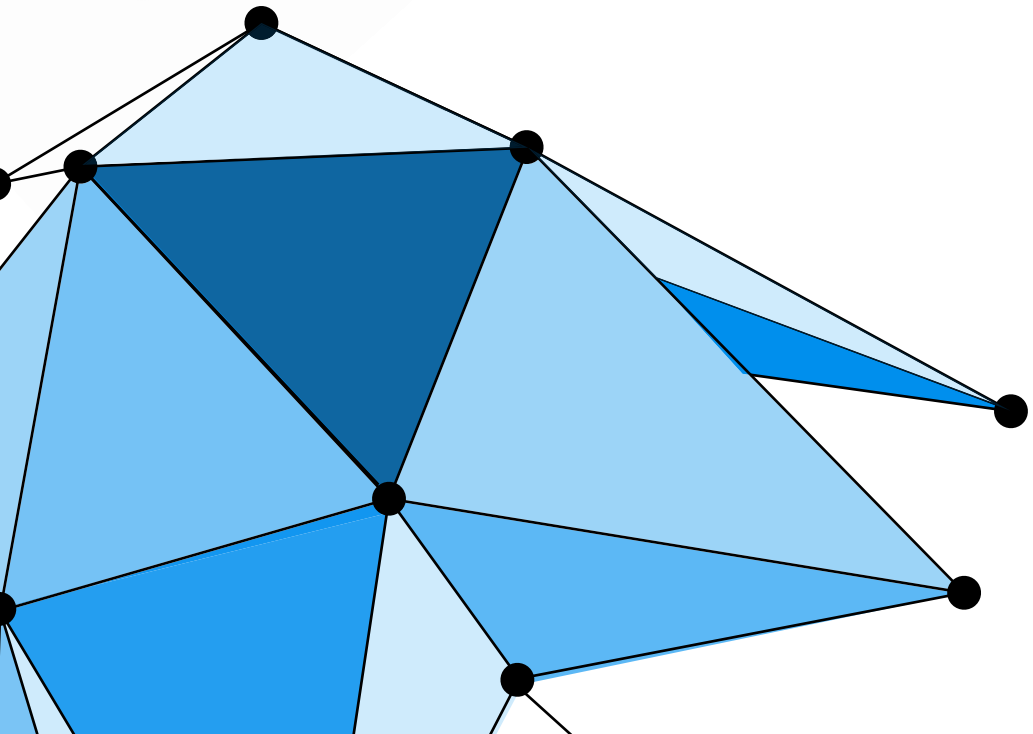
When I told Kenge that the insects were buffalo, he roared with laughter and told me not to tell such stupid lies. (Turnbull 1963, 217)

Because Kenge had no experience of seeing distant objects he saw them simply as small.

This is a famous 'impossible object', sometimes known as the Devil's Pitchfork.

After looking at it for a few moments, turn away and try drawing it. Are there three prongs or only two? Not suprisingly, this figure is sometimes given the paradoxical name of 'the two-pronged trident'.





It is an impossible object since it could not be constructed in three dimensions - it only appears to be in three dimensions at first glance. You have to look quite carefully in order to realize this.

This figure confuses many Western observers. The confusion arises from trying to interpret it as a three-dimensional figure. Deregowski (1969) found that people who habitually ascribed three-dimensionality to pictures had more difficulty in reproducing this figure than people who did not seek to impose three-dimensionality on images. The shorter the prongs the less easily fooled we are, which suggests that in the illusory version we are less able to relate one part to another.