

Re: Perceptual symbol systems

Source: <http://sci.tech-archive.net/Archive/sci.cognitive/2004-08/0407.html>

From: Glen M. Sizemore (gmsizemore2_at_yahoo.com)

Date: 08/11/04

Date: Wed, 11 Aug 2004 16:57:00 -0400

DM: There is a reason we have those particular 30+ cortical centers that each perform more or less specific types of processing on the incoming visual information.

Natural selection selected for those particular processing types because the information they provided to the organism enhanced survival. The information selected for was common and repeatedly found in the environment the organisms evolved within. Trees have vertical edges, stones are blobs, other animals [predators/etc] move, all have colors, objects close in have larger parallax differences than those further away, on and on. The visual system organization didn't just happen, it happened for a reason. The reason they're coded into the genes is because they help the organism survive in the environment is evolved into.

GS: If this were true then Stratton's goggle experiments would not have turned out as they did, Little Danny. And there are a host of experiments with simple animals that suggest that sensory systems are enormously plastic. As O'Regan and Noe suggest, if aliens came down and hooked up a fetus' auditory receptors to his or her visual cortex, and the eyes up to the auditory cortex, we might have trouble seeing an effect. This is perhaps a slight exaggeration, but it provides the alternative to Little Danny's generally simplistic views

"dan michaels" <feedbackdroids@yahoo.com> wrote in message news:8d8494cf.0408110934.7bfeeb18@posting.google.com...

> *Traveler* <traveler@nospam.com> wrote in message

news:<tf1jh09cfr6bevobdtokbu98lm2mc7v2lh@4ax.com>...

> > *In article* <8d8494cf.0408101814.3bc29230@posting.google.com>,

> > *feedbackdroids@yahoo.com* (dan michaels) wrote:

> >

> > > *Traveler* <traveler@nospam.com> wrote in message

news:<i4jfh0tg5dqnm16ourmo8s7fol84chbneh@4ax.com>...

> > >

> > >

> > > > *There is very little in the brain that is related to the world around*

> > > > *us when we are born.*

> > >

> > >

> > > > *One wonders where did the 30+ visual areas in the cortex come from,*

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- > > >and why are they interconnected via 1100+ pathways. Why are there edge
- > > >detectors, movement detectors, color detectors, shape/blob detectors,
- > > >orientation detectors, binocular disparity detectors, on and on?
- > >
- > > What makes you think any of it has to do with our particular
- > > environment? Certainly it has to do with the design of the eye which
- > > is based on the physics of light at certain wavelengths and the
- > > refraction index of the lens. And it's true that the visual cortex is
- > > genetically designed to recognize edges, lines directions, etc... But
- > > all this stuff is just generic visual sensory capabilities. The eye
- > > and the visual cortex have nothing to do with the actual things that
- > > you look at. That is to say, they could not care less where you set
- > > you gaze: animals, trees, people, stars, rivers, rocks or what have
- > > you.
- >
- >
- > Well, in fact, that is the point. There is a reason we have those
- > particular 30+ cortical centers that each perform more or less
- > specific types of processing on the incoming visual information.
- > Natural selection selected for those particular processing types
- > because the information they provided to the organism enhanced
- > survival. The information selected for was common and repeatedly found
- > in the environment the organisms evolved within. Trees have vertical
- > edges, stones are blobs, other animals [predators/etc] move, all have
- > colors, objects close in have larger parallax differences than those
- > further away, on and on. The visual system organization didn't just
- > happen, it happened for a reason. The reason they're coded into the
- > genes is because they help the organism survive in the environment is
- > evolved into. If they didn't intimately help survival in the real
- > world, then the organisms would have gone extinct long ago.
- >
- > Many of these centers exist in other mammals, but apparently humans
- > have more types. From an evolutionary perspective, these are all
- > basically outgrowths and reuse of processing centers which exist in
- > vertebrates lower than mammals, such as amphibians and reptiles; but
- > as mammals evolved, the processing became less specific and more
- > general, which allowed new species to appear. Supposedly objects that
- > don't move are invisible to frogs – frog survival apparently isn't
- > enhanced by being able to recognize a tree or a rock, although this
- > idea does seem strange. Apparently frogs don't move fast enuf that
- > they need to recognize a tree prior to running into it. Whatever.
- > Animals that move fast need to be able to "predict future" – as
- > Dennett says – so evolution gave them the necessary visual centers –
- > ability to perceive binocular parallax, etc.
- >
- > It's for all of these reasons that I say our perceptual systems give
- > us a "close-enough" internal representation of the outside world. We
- > have to learn the names for objects, etc, and we have to learn as
- > babies to distinguish object from background, and other
- > characteristics of the physical world, but this would not be very
- > effective if we didn't posses those 30+ visual centers provided by

> *evolutionary processes.*

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>

>

> *As babies, we learn to recognize the objects around us. The*

> > *visual system is extremely general. Note, however, that recognition is*

> > *mostly learned in the hippocampus, assuming, of course, that I*

> > *understand this stuff correctly.*

> >

> > *Having said that, this is not entirely true of most animals. It is*

> > *known that some animals (e.g. some species of birds) are born with the*

> > *ability to recognize their predators. Most predators are born knowing*

> > *what their preys look and smell like. But this information is not in*

> > *the visual cortex but in hippocampal memory.*