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## FRONTAL CORTEX



### What Is It Like To Be A Baby?

BY JONAH LEHRER 09.23.10 | 12:07 PM | PERMALINK

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We all know what attention is. William James said it best:

Attention is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state which in French is called *distraction*, and *Zerstreutheit* in German.

James is describing the spotlight model of attention: If the world is a vast stage, then we only notice things that fall within the narrow circle of illumination. Everything outside the spotlight remains invisible. This is because, as James pointed out, the act of attention is intertwined with the act of withdrawal; to concentrate on one thing is to ignore everything else.

And this brings me to my question: How do babies pay attention? What is it like to look at the world like an infant? The question is particularly interesting because the ability to pay attention, focusing that spotlight on a thin slice of the stage, depends on the frontal cortex, that lobe of brain behind the forehead. Alas, the frontal cortex isn't fully formed until late adolescence - ontogeny recapitulates phylogeny - which means that it's just beginning to solidify in babies. The end result is that little kids struggle to focus.

This has led the UC-Berkeley developmental psychologist Alison Gopnik - I'm a huge fan of her latest book, *The Philosophical Baby* - to suggest that babies don't have a spotlight of attention: *They have a lantern.* If attention is like a focused beam in adults, then it's more like a glowing bulb in babies, casting a diffuse radiance across the world. This crucial difference in attention has been demonstrated indirectly in a variety of experiments. For instance, when preschoolers are shown a photograph of someone - let's call her Jane - looking at a picture, and asked questions about what Jane is paying attention to, the weirdness of their attention becomes clear. Not surprisingly, the kids agree that Jane is thinking about the picture she's staring at. But they also insist that she's thinking about the picture frame, and the wall behind the picture, and the chair lurking in her peripheral vision. In other words, they believe that Jane is attending to whatever she can see.

Or consider this memory task designed by John Hagen, a developmental psychologist at the University of Michigan. A child is given a deck of cards and shown two cards at a time. The child is told to remember the card on the right and to ignore the card on the left. Not surprisingly, older children and adults are much better at remembering the cards they were told to focus on, since they're able to direct their attention. However, young children are often better at remembering the cards on the left, which they were supposed to ignore. The lantern casts its light everywhere.

And now there's a brand new paper in *Psychological Science* by Faraz Farzin, Susan Rivera and David Whitney that provides some of the best evidence yet for the lantern hypothesis. The experiment itself involved tracking the eye movements of infants between 6 and 15 months of age. The researchers used a special stimuli known as a Mooney face. What makes these images useful is that they can't be perceived using bottom-up sensory processes. Instead, the only way to see the shadowed faces is to stare straight at them - unless we pay attention the faces remain incomprehensible, just a mass of black and white splotches. In this experiment, however, the babies were able to perceive the faces even when they were located in the periphery of their visual field. (Trust me: You can't do this.) Because their lantern was so diffuse, they were able to notice stimuli on a much vaster sensory stage. In subsequent experiments, the researchers found that this lantern of attention came with a tradeoff. While babies notice more, they see with less precision. In fact, the "effective spatial resolution" of infants' visual perception was only half that of adults, although it steadily increased with age.

In *The Philosophical Baby*, Gopnik speculates that, while we often assume the inability to pay attention is a failing, a limitation imposed on infants by their

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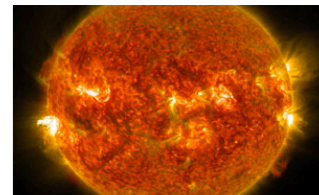
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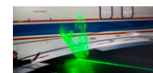
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mushy frontal lobes, it also confers certain advantages. For starters, it allows young children to figure out the world at an incredibly fast pace. Although babies are born utterly helpless, within a few years they've mastered everything from language - a toddler learns 10 new words every day - to complex motor skills such as walking. According to this new view of the baby brain, many of the mental traits that used to seem like developmental shortcomings, such as infants' inability to focus their attention, are actually crucial assets in the learning process. Because babies notice everything, they're better able to figure out how it all hangs together. So the next time you look at a baby, remember: They can see more than you.

Note: Sometimes, of course, it's helpful for adults to engage in lantern-like attention. See, for instance, this recent [post](#) on latent inhibition and creativity.

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