

Little Big Heads

For those who think that babies just eat and sleep, eye-opening research proves otherwise. **Laura Gascoigne** explains that a baby's brain is far more sophisticated than we imagined

We tend to think of young babies as being like plants – for the first few months they do nothing but grow. Because their signals aren't always clear to us, it's easy to dismiss them as unresponsive. But as Professor Trevarthen of Edinburgh University, a leading expert on infant development, points out, it would be very odd for human newborns to have huge brains if they were not expected to use them.

Research in infant psychology is now proving that not only do newborn babies use their brains, they do so in a highly organised way. For example, we used to believe that newborns are guided by instinct alone; in other words, they don't decide to do a thing and then do it. But American psychologist Dr T Berry Brazelton has found babies as young as three weeks old deliberately reaching out to touch an object, and he has listed a wide range of methods by which they will attempt communication. A baby of only one week old will pull or turn away deliberately if you do something that she

doesn't like; on the other hand, she'll brighten and turn to face you if she is interested in what you are doing and, when her interest has been really captured, she'll make a positive effort to maintain eye contact.

It's hard to see these responses as accidental: the baby clearly means to be understood. If you do something and she turns away, the message she is giving you is "Stop!". On the other hand, if she likes what you're doing, she'll show it by a positive response. She's doing what all human beings do – communicating by expression and gesture her views about the present situation.

This seems to do away with the old assumption that newborns cannot tell objects from people. Newborns have clearly shown, in different settings, that they respond quite differently to people. In one experiment at St Mary's Hospital in London, Dr Genevieve Carpenter showed newborns from one week old upwards three different "faces" in an opening: one was the baby's mother's,

one a shop dummy's and one a colander with artificial features. By two weeks old, the infants saw a difference; they looked for longer at the unreal faces.

This leads us to an interesting question: how does a newborn baby recognise an object?

The latest research into this complex area has thrown up some astonishing results. One of the things all children have in common is that they are incurable copycats. Studies of newborn infants have proved that babies no more than a few hours old can imitate their mothers' facial expressions, eg suggesting surprise, fear or sadness; by the time she is a month old, a baby can even copy – with a little effort – her mother sticking out her tongue.

HOW DO THEY DO IT?

How do babies find the right muscles? Researchers think the baby has a mental map, which corresponds to the patterns she sees. In other words, the pattern of the mother's features triggers a sensory echo in the baby's brain which helps her bring the right muscles into play. This may explain babies' fascination with faces: it stems from the delight of recognition.

Tom Bower, an American researcher at the University of Texas, thinks babies respond to form rather than content.





Reflections

What the baby takes in is not her mother's face as such, but how her features combine together in movement. So, the baby is less concerned with objects than with how those objects relate to one another.

To test this theory, Bower staged an experiment showing babies a human face with the features sketched in with spots of lights, rather like a simplified dot-to-dot picture. When the face was still, it got no reaction, but when it widened its mouth or opened its eyes, babies as young as three days copied it.

Bower obtained some other startling results with a contraption called the Sonic Guide. Newborns will flinch if an object comes too close, and Bower wanted to test the babies' responses when the object was heard rather than seen. In a dark room, an object was moved towards them, ending by lightly touching the babies' faces. A sound was played to track the object's movement – as it came closer, it decreased in pitch. The infants very soon learned to use the sound as a guide, and flinched before the object touched them.

The evidence of this test is conclusive; not only can babies interpret complex signals, but they can apply their knowledge in different areas. And babies no more than a few weeks old can cross-reference from one sense to another.

Astonishing proof of this was recently given in an experiment with babies' dummies. A group of three-week-old babies was blindfolded and each was given one of several dummies to suck. When the blindfolds were taken off, the babies could pick out their dummy by sight.

For anyone who thought that babies just ate and slept, these results must come as a revelation.

But what can parents learn from these findings?

Don't look down on your baby. Her head is far from empty, it's positively buzzing with ideas.

Respect her body language. If she turns away when you'd like her attention, she may be saying, "Not now. Later. I'm busy."

Beware of your importance. If the conclusions of recent research are right, babies first become familiar with the outside world by learning how things relate to one another. And what model do babies have to work from? Their relationship with you. **M**

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LOOK AWAY

Why is it that some babies react to frustration by being sad, others with anger and still others apparently with happy resignation? The American psychologist Edward Tronic puts it down partly to their grasp of "coping behaviours", such as looking away and thumbsucking, by which babies soften the knocks of existence. It has been proven that looking away reduces infants' heart rates during stress. Infants will also use this behaviour as a breather, when they need to take a break from stimulation, or to digest some novel information.

BABY TALK

Not only do infants express themselves in gesture, they start to imitate speech within a few weeks. Movements in infants of two months have been identified which prove that the foundations for speech are already there at birth. The dialogue a baby has with her mother certainly has the appearance of a conversation, and that is how babies themselves see it.

This has been proven in an ingenious experiment where a sample of mothers, who had been talking to their babies, started to address an unseen adult. Although the mothers didn't change their position, they subtly changed their style of address, and stopped paying attention to their baby's conversation with them. At first, the babies made wild efforts to recapture their mother's attention but, after a bit, when they had no success, they became upset and, finally, dejected.

SPOT THE DIFFERENCE

In some ways, babies' perceptions can be keener than ours. Psychologists have found that 12-month-old babies tell the sex of other babies from slides and, although they can be fooled by cross-dressing, they never make the same mistake with film. Tom Bower repeated his experiment with lights, using them to trace figures of 12-month-old boy and girl babies filmed in the dark. On average, the boys looked almost twice as long at the boy baby, the girls at the girl baby.