

The Babylab

Centre for Brain and Cognitive Development

Newsletter

AUTUMN 2005



The Babylab is supported by the Medical Research Council

Thank You...

... to all the parents, grandparents and carers who have volunteered their babies and toddlers to help our scientific research. Since the previous Newsletter in October 2004, we have had an even busier year, we now have over 2000 names on our current Babylab database, and over 1000 separate visits have taken place. Thank you very much!!

We are also very appreciative of the support we get from Health Visitors, GPs, playgroups, nurseries, and staff in Mothercare and other shops who display our posters and leaflets. We are beginning a big recruitment drive over the next few months - we have several new members of staff who will be starting new projects and so we need to recruit as many volunteer babies and parents as we can. If you know anyone who would be interested, please pass on our details, many of our new recruits have come by word of mouth – we are very grateful to you all!



Alex Tombs

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Media News

You may have heard 'More or Less' on BBC's Radio 4 earlier this year on the 10th February when Dr Denis Mareschal talked about Number Concepts and the limitations of using infant behaviour as a measure. Liam Brierley and his mother Carrie helped us out with that interview.



More recently we have had a second BBC Radio 4 interview on Professor Raj Persaud's 'All in the Mind' programme on the 9th August 2005. Dr Victoria Southgate was talking about our 'Tubes' Study and what happens during a typical visit to our Babylab. Leyla and her mother Honey Halit (a researcher at the Babylab) helped us out with that interview, which you can listen to through the following webpage -

http://www.bbc.co.uk/radio4/science/allinthemind_20050809.shtml

Finally, we also had an article published in National Geographic magazine in March 2005. Dr. Jordy Kaufman and Leslie Tucker were interviewed about the 'All Gone' Study with help from Emily Ryan, Edan Silbiger and Lydia Tucker, our willing volunteers. The photos for this article were taken by internationally renowned photographer Cary Wolinsky, one of which you can see here.

In the following pages you can read about the studies that have been completed in the Babylab over the last year:

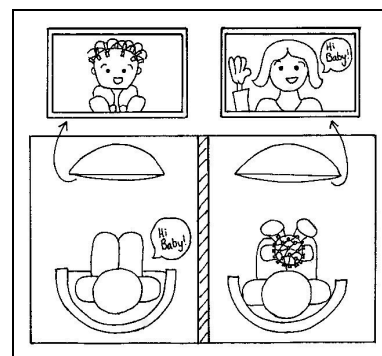
The "Delay" Study

by Kazuo Hiraki & Sarah Fox

When we enjoy a chat with our friends, we consciously or unconsciously expect them to respond to us in proper time. For example, if we say "How are you" to someone and they do not respond for a few seconds, then we could assume he or she might have some sort of problem even if they reply "OK." In any communication the timing of our responses to each other plays an important role. In this study, we investigated whether infants are also aware of the temporal aspect (timing) of communication.

Infants communicated with an experimenter (actor) via a setting called a double TV system, where an infant and the experimenter could interact by seeing one another's facial expressions. The system contained a special device that could insert a delay of a few seconds to video-image and sound. This enabled us to focus on the timing of the interaction by seeing "Live interaction" and "Delayed interaction." We compared

infants' reactions using measures of brain activity to investigate whether they can distinguish between the Live interaction and the Delayed interaction.



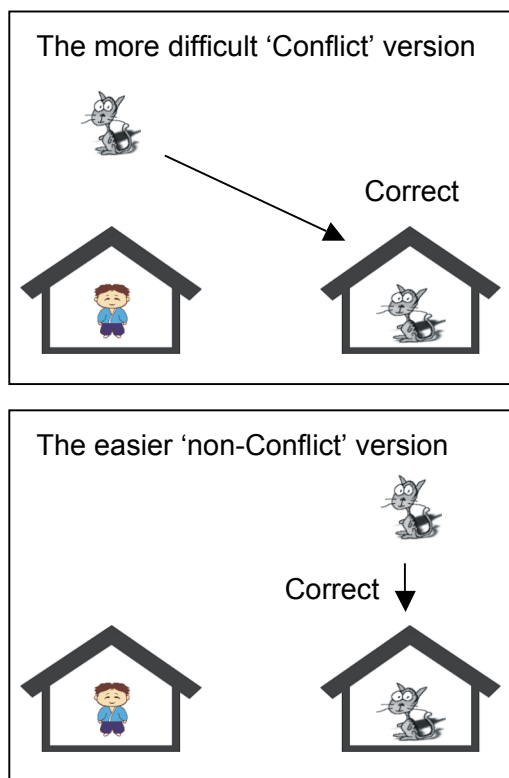
We found that the infant brain showed a higher level of activity during the Delayed interaction than Live interaction, suggesting that they can tell the difference between unusual interaction and normal interaction. Although further analysis should be done to clarify this conclusion, this is the first experiment which measures infants' brain activity focusing on the temporal aspect of interaction.

The “Way Home” & “Bayley” Studies

by Karla Holmboe

In this study we followed up a group of children who first visited us at 9 months of age to do the Freeze-Frame and A-not-B studies where we presented them with tasks developed to measure their ability to inhibit automatic responses in order to get a reward.

At the second visit the children were 2 years old. At this visit the children performed a task that involved a touch screen – the Way Home study. They had to match two pictures that were either on the same side of the screen or on opposite sides by pressing the touch screen on the correct picture (see diagram below).



This task is thought to be another measure of the ability to overcome a strong response tendency (in this case responding on the same side of the screen) and even adults are a bit slower when the top and bottom pictures are on opposite sides (Conflict). As expected the task was much harder for children when the pictures were on opposite sides.

We also conducted a second study called the ‘Bayley’. This is a set of games that look at things like how children learn physical and problem solving skills (see photo opposite, of a child about to climb stairs).



Agatha Higgott

The “Wheelie” Study

By Seok Hui Tan

In this study, we presented 18-month-old infants some toys to play with. These toys included animals (e.g., giraffe, zebra), vehicles (e.g., cars), and novel toys which were half animal and half vehicle – some had animal bodies and wheels (instead of legs), while others had car bodies and legs (instead of wheels). We were interested in how the children would group all these test toys. In particular, we looked at whether the children would group the toys *by their parts*, that is whether they would group the toys with legs separately from the toys with wheels, or whether the children would group the toys *taxonomically*, that is whether they would group the toys which ‘looked’ like animals separately from the toys which ‘looked’ like vehicles, e.g., grouping toys with animal bodies and heads separately from toys with car bodies.

Before this categorisation task, we also showed the children some other toys – dolls or trucks. In this familiarisation phase of our study, we randomly assigned the children into two groups. With one group, we showed the children that the dolls had legs or that the trucks had wheels. With the other group, we showed the children how they could play with the dolls or trucks (e.g. ‘walking the dolls’ and ‘making them talk’, or ‘driving’ and ‘parking’ the trucks), instead of showing them the specific parts of the dolls (legs) or trucks (wheels). We were interested in whether children who were shown the legs of dolls or wheels of trucks were more likely to group the test toys by their parts (e.g., legs vs. wheels), and whether the children who were shown how to play with the dolls or trucks were more likely to group the test toys taxonomically.

We found that in the test phase, the children played with the cars separately from the rest of the toys; the children also did the same with the animals. This meant that the children grouped the cars separately from the animals, and these two groups from the other toys – the strange-looking half-animal and half-vehicle toys. We found that the children who were shown the parts of the familiarisation toys (legs of dolls or wheels of trucks), tended to group the test toys with legs separately from the toys with wheels, while children who were shown how to play with the familiarisation toys, tended to group the toys which ‘looked like’ animals separately from those which ‘looked like’ vehicles. Finally, the children who were shown how to play with the familiarisation toys were also more likely to show both patterns of categorisation than the children who were shown the parts of the familiarisation toys. These findings suggest that infants at 18 months can adapt their strategy for categorising objects to the context in which the objects are presented.

The “Cat ‘n’ Dog” Study

by Andy Bremner & Denis Mareschal

One important development in early childhood is in learning to control knowledge. As well as learning about how to do things (like, for example, writing with a pen) children have to learn to control their expression of this skill to certain situations (for example when there is some paper to write on, rather than just the carpet; an application liable to lead to problems). Psychologists call this ‘cognitive control’.

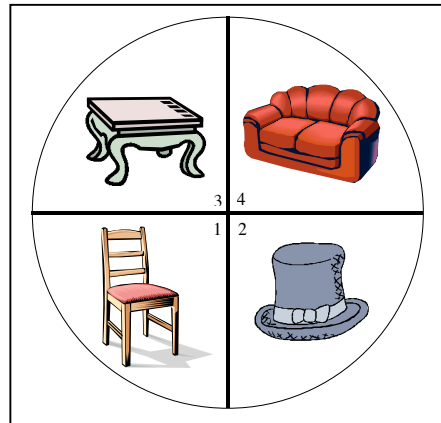
We were testing an ability to control knowledge with the “cat ‘n’ dog” task. We taught children a sequence (e.g. 132412) by asking them to copy a series of movements made by the experimenter (the **training phase**). We did this by playing a game in which a cat (the experimenter) is chased around four hiding places by a dog (the child participant). After this training phase we told the children that the cat was always going a special way through the house, and then asked them to do one of two tasks:

i) The **inclusion** task

The children are asked to repeat the sequence they learned during the training phase.

ii) The **exclusion** task

The children are asked to follow a sequence that is different from the sequence they learned during the training phase.



We found that even at 2 years of age, children can control their expression of this sequential knowledge, depending on the experimenter’s instructions. This is quite surprising as children are not very good at other cognitive control tasks until about 4 years old! We think that the cat ‘n’ dog task is easier for young children because it allows them to express their cognitive control in the way they choose.

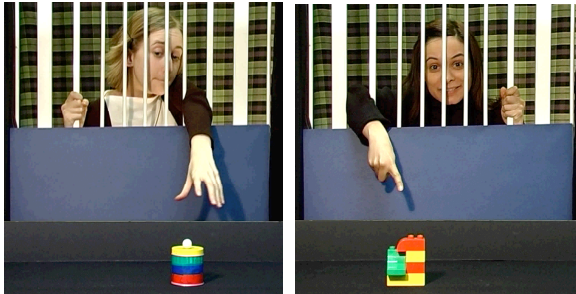
The “Reach & Teach” Study

by Davie Yoon

Developmental scientists have documented striking differences in the way infants and adults remember objects. Specifically, young infants fail to remember spatiotemporal (“where”) information for some objects and, for other objects, fail to remember surface feature (“what”) information. In other words, infants can only remember either where an object was (its location), or what the object was (its identity), not both, the way adults can. The developmental origin of these memory differences may stem from differences integrating two separate neural pathways: the dorsal (“where”) and ventral (“what”) visual processing streams in the brain. Before integration between the pathways develops, what determines the kind of information infants remember about the objects they see?

To investigate whether our actions could influence when infants remembered location versus identity, we showed infants two kinds of object-directed actions: (1) a reaching action and (2) a teaching action—which included the kinds of rich social cues parents

naturally provide for their infants, such as eye contact, smiling, waving, and pointing. We found that when infants viewed a person reaching towards an object, they then had superior memory for that object's location. When infants instead watched a person teaching them about an object, they then had superior memory for that object's identity.



Reach or Teach

Thanks to the many participants in this study, we now have evidence that our actions have an important influence on how infants perceive and remember the world around them. Because infants must first be able to remember an object's identity before they can learn the name for that object, the special social cues given during a teaching action may play an important role in early word learning. In the future, we will build on this project by investigating how teaching actions can support rapid word learning by helping infants match the name they hear for an object with that object's specific identity during only a few minutes of training.

The "Tubes" Study

by Victoria Southgate

Toddlers are surprisingly bad at finding a hidden object. In the task pictured on the right, a ball is dropped down a tube and two-year-olds were asked to reach for the ball. Consistently they searched in the box directly below where the ball was dropped, rather than in the box at the end of the tube. Even after 10 or 20 trials, they persisted with this inappropriate response. The reason they do this may be because they initially expect that all falling objects will fall straight down and perhaps they are unable to take into account other things that may change this rule, such as the presence of a tube to constrain the trajectory of the ball.

It has been suggested that the difficulty that toddlers may have with search tasks like this one, is that they are unable at this age to

predict, in advance, the future location of the ball. The ability to predict may be a rather later developing capacity in children. In the new study we have been running at the Babylab, we asked whether it is true that two-year-olds really have an inability to predict the location of a ball.

To do this, we showed two-year-olds a video of the tubes task, and after they saw a ball being dropped down a tube, they heard someone say 'where is the ball?' The use of an eye-tracker in this study allowed us to see exactly where children were expecting the ball to be when the hands appeared on screen to open the boxes. We found that, contrary to this prediction explanation, two-year-olds were very good at predicting where the ball would be – with their eyes. The question of why they are not so good at predicting where the ball would be when this task is presented as a search (reaching) task is something that we hope to resolve with future studies.

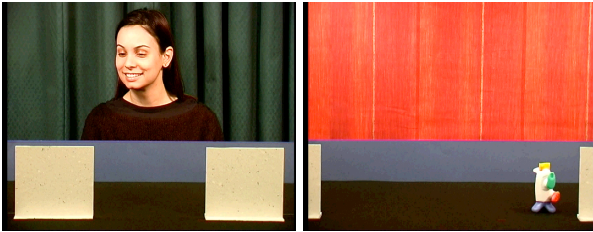


Sammy Sturzaker

The "Follow Me" Study

By Gergely Csibra

When we see someone staring at a certain point in the environment, we tend to follow their gaze and search for what they are looking at. Babies also do this: they follow their mother's gaze and look in the same direction. The assumption that if someone deliberately turns to look in one direction or another, then there must be something there, is so strong that we would be surprised to learn that the person was staring at nothing. This study tested whether infants share this assumption with us.



We showed 8- and 12-month-old babies short video clips in which a woman looked behind one of two barriers, and then we revealed whether there was an object there. We videoed the babies while they were watching these events, and later analyzed where they were looking. Babies do not usually like to look at "nothing", so they spent most of the time gazing at the toy that appeared from behind a barrier. However, on many occasions they also looked at the other, empty, side of the screen. We found that they did this more frequently when the woman had gazed at that location previously than when she gazed toward the toy's side. This indicates that even young babies expected to find something at the empty side and attempted to find it when it did not appear there.

The results of this study reveal that infants don't just reflexively turn when they see someone is suddenly looking in a certain direction, but they also assume that this looking will indicate something interesting. Infants seem to know that they can learn a lot from others!

Lab News

People moving on:-

After a year with us, **Dr. Kazuo Hiraki** has returned home to Tokyo.

Jennifer Yoon (known as Davie) has finished her work with us for her Masters degree and has returned to Stanford University, California.

Dr. Sanya Krljes has left the Centre to begin Clinical Psychology training at University College London.

"In-house" babies:-

We are pleased to tell you that **Dr. Jordy Kaufman**, who many of you may remember from the 'Noddy's Train' Study or the 'All Gone' Study, became the proud father of his first child on 15th July 2005. Congratulations to Jordy, Chris and Zachary.



We are also pleased to announce that **Dr Teresa Farroni** gave birth to her first child on 30th September 2005. Congratulations to Teresa, Stefano and Elia. Here he is taking part in his first experiment at the age of just 36 hours! Dr. Farroni herself is in charge of this research with newborns which takes place in Trieste.



Finally we are very pleased to tell you that **Dr. Elena Kushnerenko** just gave birth to her third daughter on 7th November 2005. Congratulations to Elena, Ivan and Agnessa. Some of you will probably remember Elena from the 'Look Away' Study which has been running for the last few months.



Frequently Asked Questions

Q: I received my packet of information from the Babylab months ago, but I've not been asked to participate in a study.... will I get a call?

A: Whether or not you are called for an appointment is completely dependent on the studies that are currently running. Each study has an age range that is specific to that stage of infant development. If you have not been contacted, it is not because we have forgotten about you, it is only because your baby does not fit into the age range of one of our current studies. However please bear in mind that studies are constantly beginning and ending.

Q: Can I participate if I do not live in the London area?

A: Yes. We often have families visit us from the surrounding counties. Although we cannot arrange your transportation to the Babylab from outside the London area, we will reimburse you for your travel.

Q: What if my baby is asleep, hungry or wet upon arrival?

A: Many babies fall asleep during their journey to the Babylab. We try to let the babies make their own schedule. We want happy babies so that they will be content to sit through our studies. If a baby is tired, hungry or wet, they are unlikely to remain calm. Therefore, we encourage you to carry on with their normal schedule even if it is during a visit. We have changing facilities at the Babylab and you can also feed your baby in the reception area. Water, tea and coffee are always available for parents and carers. However, if you know that your baby naps/eats regularly during certain hours, please mention this when booking an appointment.

Q: I want to participate in a study, but I have other children who are not in school. Can I bring them with me?

A: Yes, if you think they'll be happy to be left with one of us, playing with the toys and books in the reception area while you spend a few minutes away from them with the baby doing a study. We're always pleased to take time-out from our computer screens to entertain siblings.

Q: Do you ever need adult participants for your studies?

A: Yes. Sometimes we do run studies and require adult subjects. There are also other studies running within the Department of Psychology at Birkbeck College. If you are interested, you can fill out a Volunteer Form at http://www.psyc.bbk.ac.uk/general/subject_form.html

Q: I would like to visit the Centre, but would like to find out more about travel arrangements. How is it done?

A: We will always cover your travel expenses when you come to visit the Babylab. If you are outside of our taxi zone you can arrange your own taxi/train, keep your receipts, and you will be reimbursed during your visit. We can provide a taxi service if you live within five miles of our Centre.

If you decide to drive to the Centre we provide a parking space outside our building reserved for visiting parents. We always reimburse petrol costs and the £8 for the congestion charge. Please do remember though that we cannot pay the congestion charge for you, though if you are unsure of how to pay the charge we can help you through the process during your visit.

Q: Can I find out if my baby is developing normally from the data you collect during your studies?

A: At the Babylab, we do not study the performance of individual babies. Our studies are not intended to be diagnostic tests that give results on the development of the individual, but the information we receive from the babies is averaged-out to provide overall results.

Q: What if my baby does not want to participate on the day?

A: You should not feel badly if your baby decides they would rather not participate on the day of your appointment. This can be for many reasons: heat, teething, illness, tiredness, etc. Some babies just find the study too boring to look at. This does not mean, however that your baby will always react in this way during a study. Babies change day to day, hour to hour. We will be happy to ask you back for another visit if your baby comes within the required age-range.

Thank you for your support!

Babies Needed for New Study!

Baby Siblings of Children with Autism Spectrum Disorder

How do babies learn about the world around them?
Why are social cues such as direct eye contact important to them?

To answer these questions, we are conducting studies that examine the development of babies who have siblings with autism. We would like to know in what way, if any, these babies differ from those who do not have siblings diagnosed with autism spectrum disorder. If you have a baby under 14 months of age, or are pregnant, and have an older child with autism please contact us. Travel costs to central London (WC1) are reimbursed. For further information, please contact Jane at the Babylab.

Update: Work has finally begun on our new building which we hope will be fully-functioning by this time next year. It is only a few doors away from where we are now (just behind the Clore Management Centre). We are grateful to The Wellcome Trust, Lord and Lady Wolfson and the Rayne Foundation for funding towards our new centre, and we will keep all our volunteers up-to-date on the progress of the build.

Join the Babylab or update your information

Don't lose touch! If you are moving house or having another baby please let Jane know so that we can update our records. Ring us on 020 7631 6258 or return the form below. Feel free to pass this form on to a friend who you think may enjoy a visit to the Babylab.



PARENT'S NAME:	_____	TEL:	_____
ADDRESS:	_____ _____		
POSTCODE:	_____	E-MAIL ADDRESS:	_____
BABY'S NAME:	_____	SEX:	_____
BABY'S DATE OF BIRTH (OR EXPECTED DATE):	_____		

Please return form to:
CBCD FREEPOST 32 Torrington Square, London WC1E 7BR
Tel: 020 7631 6258 or email: babylab@bbk.ac.uk with your details
Website: www.cbcd.bbk.ac.uk