



gemini

health and development in twins

Newsletter

ISSUE 3

DECEMBER 2010

Gemini findings from 2010

What to expect in this issue:

- ★ Latest Findings...
- ★ Interview with a Gemini team member
- ★ Zygosity in Gemini
- ★ Gemini Genes
- ★ Growth and Questionnaire updates

Gemini

CR-UK Health Behaviour Research Centre,
Department of Epidemiology and Public Health,
University College London
1-19 Torrington Place
LONDON, WC1E 6BT, UK

Phone: 020 7679 1263

Fax: 020 7679 8354

Gemini@public-health.ud.ac.uk
www.geministudy.co.uk

The researchers of the Gemini team have been working hard examining information that you have provided for us. Here are some of the main findings from this year...

Zygosity results

Inside this newsletter (page 3) we report exciting new findings from our test to establish whether same sex twins are identical or non-identical.

Infant weight gain

Weight gain after birth follows a complex pattern. Therefore we have collected as many weight measurements throughout infancy as possible. You have been fantastic in providing us with about 10 weight measurements for each twin during the first 6 months.

Together with a statistician at the Institute of Child Health in London we have used all weight measurements to assess growth in a complex but very precise way. Three different components of weight gain are distinguished:

1. how **big** the child is in infancy
2. **when** the child grows fastest
3. how **quickly** the child grows

The next step will be to examine which components of weight gain are influenced by genes and to explore alternative influences on weight gain.



Pictured: Gemini twins Matthew and Chloe

Infant appetite and weight

Many of you fill in our infant appetite questionnaire designed to measure appetite in young children when they are still exclusively milk fed. This questionnaire is now being used by other groups of researchers in the UK and has been translated into Dutch, French, Italian, Danish, Swedish and Chinese!

Next, we will examine how appetite in young infants is related to later growth.

Dr Ellen van Jaarsveld, Gemini study co-ordinator

For more information on these and other findings so far, please visit the Gemini website.
www.geministudy.co.uk

Interview with a Member of the Gemini Team

Stephanie Schrepft is a PhD student working on the Gemini study. Stephanie talks about her role in the Gemini study, with a particular focus on the home environment.

How did you become involved in Gemini?

I completed a Masters in Research at UCL and worked on several different research projects. I have always been particularly interested in understanding how genetic and environmental factors interact to influence eating behaviour and weight. Coming from a family with a history of twins, I am also intrigued by the similarities and differences that emerge as twins develop. Working with the Gemini team therefore provided a fantastic opportunity for me to focus on my main research interests.

What is the Gemini study investigating?

There are several interesting projects taking place in Gemini at the moment. The project that I am involved with is looking at the home environment in relation to appetite, growth, and weight. The home envi-



Gemini twins Sofia and Elena

ronment is a large research area, which includes both physical (for example outdoor space) and social aspects of the home. It is likely that many aspects of the home environment are important but some aspects may be more important than others. To investigate this area, instead of sending out a questionnaire, we have been carrying out telephone interviews. Interacting with parents in this way has meant that we can clarify any questions if needed and has been a personal highlight for me.

Why is it important to study environmental influences in the Gemini study?

So far, evidence has shown that genes play a key role in appetite, growth, and weight but environmental influences are also demonstrably important. One way of understanding how genes and the environment work together is by examining environmental influences using a twin design. The Gemini study is particularly useful in this sense as we can look at specific environmental influences whilst taking into account the influence of genes.

The Gemini Team

There have been some changes to the Gemini team since we first introduced ourselves in the 2008 Newsletter. Clare Llewellyn is finishing her PhD and is now a full time Research Associate. Dr Abigail Fisher, Alison Fildes and new PhD student Stephanie Schrepft have all joined the team, whilst Dr Laura Johnson has recently moved to Cambridge University but remains involved with the research. Professor Jane Wardle and Dr Ellen Van Jaarsveld continue to lead the Gemini study.



Pictured from left to right; Alison Fildes, Professor Jane Wardle, Dr Ellen Van Jaarsveld, Clare Llewellyn, Dr Abi Fisher and Stephanie Schrepft.

Questionnaires and DNA

Last November we started collecting DNA samples from the Gemini twins. We were delighted by the response, but it's not too late if you haven't sent yours in yet! The main reason for collecting DNA was to investigate genes related to appetite and growth; you can read more about this over the page. However, we also used the DNA to test the zygosity of 85 pairs of Gemini twins, who were randomly selected by computer, in order to check that our Similarities Questionnaire is accurate. A previous study found the questionnaire to be over 96% accurate. The fantastic news is that in Gemini 100% of our sample were classified correctly. This exceeded our expectations and means that we have faith in the questionnaire as a research instrument.

Surprising Results

One in 6 Gemini parents were surprised by our zygosity results.



Tanya, mum of Toby & Charlie (pictured) said "It was a great shock to find out my so called "non-identical twins" were in fact identical from the results you sent. I wasn't expecting that at all as they seem so different to me. Although many of my friends and family now feel justified in the difficulty they've had in recognising who is who."

Many parents of twins we identified as identical had been told previously that because their twins had separate placentas and sacs they must be fraternal. While it is true that fraternal twins have their own placenta and sac, so do one third of all identical twins. This means that using this information to identify 'twin type' can lead to many sets of identical twins being misclassified. To complicate matters further, it is possible for the two placentae of fraternal

twins to fuse together and become one, causing some same-sex fraternal twins to be mistakenly classified as identical.

As Gemini is a large, population-based sample, we can use the data we have to determine how often these misclassifications occur. The results from Gemini tell us:

★ 20% of parents who thought their twins were fraternal, were surprised to find out that their twins were in fact identical. In almost every case this was because their twins had separate placentas or sacs.

★ Only 3% of parents who thought their twins were identical found out that their twins were fraternal. Every time this was because the twins had appeared to share one placenta.

This fascinating data can be used in the future to help inform parents and the medical profession, about how frequently the zygosity misclassification of twins is occurring.

DNA Zygosity testing

Around 100 families whose children were not in the random sample, have contacted us to take advantage of paying for DNA zygosity testing (£20). We can continue to offer this up to the end of **January**, so please get in touch if you would like the test but haven't contacted us already. For the families who have already requested the test, we expect the results to be ready in March.



Emma, mum of Derek and Lewis (pictured) said "We decided to go for the DNA testing to finally clarify once and for all for our own peace of mind and to be able to tell the boys as they grow up that they are 100% identical".

Gemini Genes

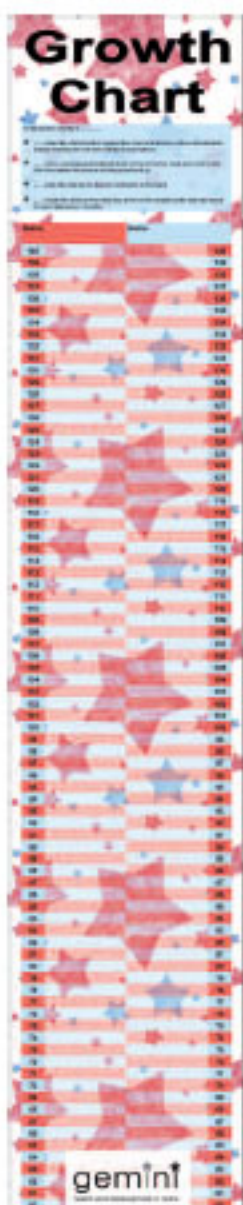


Exploring genetic influences on growth

Understanding how genes and the environment interact to affect development is a key focus of modern science – you may have come across a number of research findings related to this topic in the media (e.g. the FTO gene influencing weight). In Gemini we are particularly interested in finding genes that influence appetite and growth. Recent advances in genetic technology have made the search for key genes, related to aspects of development such as growth, cheaper and quicker than ever before. Thank you to all the families who collected DNA from their twins using cheek swabs – we are currently processing this in a laboratory at

Kings College London to identify which particular genes are involved in appetite regulation and growth; we will be able to explore these next year. The children will be divided into groups who differ on the characteristic of interest (e.g. growing more slowly or more quickly than average), and we will look to see if there are differences within specific genes between these groups. Finding genetic differences would implicate these genes in the growth process. If you are interested in finding out more about how scientists explore genetic influences on development, the following websites provide useful information:

- ◆ www.yourgenome.org
- ◆ www.insidedna.org.uk



Growth reminder

Thank you all again for continuing to weigh and measure your twins and send us the results. The measurements you provide are extremely important to the Gemini study, so please keep it up! It is 3 months since we sent the last growth reminder emails and postcards so it might be time for you to measure your twins again. You can write these measurements on the Gemini growth chart. Then, next time we send you a questionnaire you can copy in all the heights and weights you have. You can also send us growth updates using our online form:

www.geministudy.co.uk/gemweight

Food Likes and Dislikes

There has been a bit of a break between Gemini questionnaires but last month we contacted all of the Gemini families about the new 'Food Likes and Dislikes' booklet. As your twins are getting older, they are probably developing quite strong opinions about their food! In this booklet we are interested in finding out about the foods your children enjoy or don't like, their responses to food and whether your twins' preferences are similar or different to one another. Thank you to everyone who has filled in the 'Food Likes and Dislikes' questionnaire so far. If you haven't completed this questionnaire yet then we would really appreciate you taking the time to do this. The questionnaire is available online at:

<http://www.geministudy.co.uk/gemfood/>

If you would like a new hard copy booklet please let us know and we will send it out to you.



Season's greetings from Gemini

