



## School Success Starts in the Womb

Success at primary school starts well before a child has entered the school gates – in the womb, in fact – based on the records of 55,000 children studied by Perth’s Telethon Institute of Child Health Research. The Institute found a correlation between low birthweights and school performance, but the origins can be traced back even further to the size of foetuses throughout pregnancy.

Institute director Prof Fiona Stanley says that the study carefully controlled for factors such as the sex of the child and parental genetics to produce an antici-

pated unrestricted birthweight for children at several stages of pregnancy. Foetuses whose growth put them on target to be below 85% of their optimal weight were considered to be growth-restricted.

Stanley stresses this is a statistical, not diagnostic, measure. Nevertheless the growth-restricted children generally went on to struggle to gain literacy and numeracy skills.

“It could be that one of the most important things governments can do to boost educational outcomes is to improve the health of pregnant women, particularly in

disadvantaged areas,” Stanley says. “I’m particularly interested that good foetal growth appears to give children from disadvantaged areas a comparatively better start. It’s easy to blame schools for poor results, but it might be more accurate to start asking about the quality and availability of healthcare, childcare and local government services in that area.”

Nevertheless, Stanley is not saying that a child born from a difficult pregnancy is doomed for life. “What we’re looking at here are broad trends which warrant policy intervention. On an individual scale, what is also true is that involved and active parents can make an enormous difference to their child’s educational attainment and well-being.” She also points to evidence from Canada that enriched preschool environments can make a large contribution to school performance.

The factors contributing to growth restriction are complex. According to Stanley: “The biggest causes are exposure to toxins and disease in pregnancy”.

Stanley notes that data on alcohol consumption during pregnancy are very poor, so it is hard to tell whether this is the reason there is a strong association with social class. She says environmental toxins such as lead, PCBs and benzenes may also play a part, and disadvantaged children are far more likely to be exposed.

## Dopamine Linked to Language

Functional MRI images have revealed the benefits of dopamine-enhancing drugs for language processing, and the brain regions involved, although the specific brain mechanisms remain unknown.

Levodopa is widely used to treat Parkinson’s disease and other conditions associated with dopamine dysfunction. As well as treating the more obvious Parkinson’s symptoms, Levodopa assists with language processing. People who come off Levodopa because of the side-effects often struggle with language.

Studies of Levodopa given to healthy people have also shown benefits. Dr David

Copland of the University of Queensland’s Centre for Clinical Research says that this is most obvious when subjects are given a word with multiple meanings and have to find the one most appropriate to the context.

Copland conducted fMRI scans on people performing language tasks who had been given either Levodopa or a placebo. Language processing with Levodopa was faster in the regions of the brain associated with language, and regions of the brain linked to attention were also more active.

Nevertheless, Copland says that the way that dopamine affects language processing is a mystery. “It’s possible that

it improves signal-to-noise ratios, where if you have a lot of information it helps you to filter the irrelevant parts out,” Copland says.

“This finding points to a potential new use for these type of drugs, so they might be combined with current language treatments to improve communication in people with brain injury,” Copland says.

Copland is more reluctant to speculate on whether Levodopa might be useful in the more common case of children with delayed language acquisition. In children, “the side-effects are less known,” he says. “Levodopa is well-studied in healthy adults in terms of safety.”