

by Paul Freedman



BRAINY!

Your child's brain through those first three years

A CONVERSATION WITH SIMON ROWLEY



It's widely known these days that the first two or three years of a baby's life are critically important. These are the years, ideally, when babies get the chance to learn about life and love and faith and trust. (Of course, in the *real* world, sadly, they're often denied that chance, and instead begin their career as a crime statistic or a social-work 'case'.)

But what's actually happening inside a growing baby's head – year one, year two, year three, and beyond? And how can we mums and dads (and uncles, aunts and grandparents) help ensure that those happenings are the best they possibly can be for our little guys and girls?

To get some answers we talked with noted brain development expert and Kiwi paediatrician, Dr Simon Rowley. In fact, we talked to him twice! Our first interview was cut short because he had to dash off to attend to a crisis and deliver a baby by caesarean!

GRAPEVINE: One of your favourite sayings is, "The first three years last forever!"

SIMON ROWLEY: That's right. I'm a member of the Brainwave Trust, an organisation you can read about online. We're trying to make sure that people have access to information about how babies' brains are wired – how things they experience affect the way their brains develop, particularly during the first three years. We're also making research available to those who work with children – such as doctors, pre-school teachers, care-givers, lawyers.

In the last few years particularly there's been an explosion in the amount of knowledge we have about early childhood, and people are realising how important those years are for brain development.

GRAPEVINE: Can we go back to square one: a newborn child? What's actually going on inside that child's brain?

SIMON ROWLEY: Well, when you're born, you're only about 15% 'wired up'. Your grey matter is all there (your brain cells or neurones), and it's all ready to go – but only 15% of it is connected. That 15% is the stuff you need just to keep the organism going: heart-rate, blood pressure, breathing – the bits that control your basic functions.

GRAPEVINE: Sort of, the 'auto pilot' stuff?

SIMON ROWLEY: That's right. But, from the moment of birth, the sensory experiences you start having cause the other 85% of wiring to happen. And most of it happens in those first three years.

WIRED-UP

Every time you touch a baby, cuddle a baby, tickle a baby, laugh with them, talk to them – all those things that happen through the senses – you're helping the baby experience and sort out the world.

The first sense to develop is *touch* – the ‘mother of all senses’. *Balance* is the next. *Smell* and *taste* come after that. Then *hearing*. And *seeing* is the last one.

Touch is actually the most basic of our senses. Mothers reach out and touch their baby instinctively right after they're born. But the other senses are also primed and ready to go, even before birth. And these are the senses by which babies experience the world.

Those experiences cause baby's neurons to start looking out and reaching out ... wiring themselves up ... creating pathways and connections to other neurons. By the time you're three, all of those things should've happened. Then, from three years on, for the rest of your childhood, you're busy pruning those connections – and you only hang on to the ones you're using continually.

But here's what's really vital (and there's good research to support this): the experiences you get *need to be the right ones*. If you don't get good, positive, warm, nurturing experiences, you're in trouble.

GRAPEVINE: These experiences the baby needs are gained primarily from its mother – right?

SIMON ROWLEY: Yes – from its primary care-giver, who's usually the mother. But sometimes it's the father. Fathers are very important in baby's development, too.

GRAPEVINE: And you're talking about stimulating the baby – talking, reading, going for walks, singing, cuddling?

SIMON ROWLEY: All of those. And they're all so important. But you can overdo it. There's obviously a healthy amount of stimulation for the brain – too much can flood it and cause it to switch off the way babies do when they're tired. However, most parents, fortunately, get it about right.

We're talking about 'good-enough parenting' here – not 'super parenting'. There's growing evidence that playing 'brainy-baby' videos and all this 'Baby Einstein' stuff isn't such a good idea ... probably more detrimental than helpful.

GRAPEVINE: You describe the baby's brain as being 'wired up'. Which all sounds very electronic – like a computer being fitted to operate a printer or something. But what about the *human* dimension? Take smiling, for example: what makes a newborn baby smile? How do they figure out what smiling means? Is that part of the 'wiring up' process?

SIMON ROWLEY: Yes, definitely. And what we sometimes overlook is that babies are 'programmed' as individuals to hit developmental targets at certain times. So at around four to six weeks you're programmed to be able to smile.

GRAPEVINE: You mean the baby has a sort of pre-formed picture in its head: "This is a smile, this will make me feel good ...?"

SIMON ROWLEY: No. The programming just provides that at this point your brain is *ready* to receive the information that's necessary to stimulate a reaction. But you've got to have, environmentally, the warmth and social interaction that'll trigger it.



GRAPEVINE: So a baby from a home where there's little stimulation, not much caring or cooing – if it happens to catch a smile from a passer-by, it won't necessarily know that this is a good, important signal?

SIMON ROWLEY: That's right. And that's an important developmental principal – *repetition* is essential.

PLAY IT AGAIN

In order to hard-wire pathways in the brain, the baby has to be exposed to things – even as simple as a smile – over and over again. That repetition then triggers what the baby's been programmed to receive and act on.

So it's got to happen frequently and consistently before it becomes ingrained. But when it does become ingrained, that's really what makes us who we are.

GRAPEVINE: I often chuckle at a video we've got of our youngest grandson who, when he was too little to stand up by himself, was hanging in one of those stretchy sling things – and he started bouncing up and down in exact rhythm with the music his mum was playing in the background. It wasn't a co-incidence, because several times he went off the beat. He'd stop, and listen, and then start bouncing again exactly on the beat.

Now – how does a baby *know* what dancing's all about? “This is *music!*” “This is *rhythm!*” Where do concepts like that come from?

SIMON ROWLEY: Fascinating, isn't it? Music's one of those things (as parents discover) that come in a window of learning opportunity. If adults try and learn a musical instrument they'll find it much harder than young children who've been brought up in a musical environment. It's like learning a language. Learning these musical ideas is the same as learning to talk.

This isn't just a 'gene' thing – it's also nurture. It's very much influenced by baby being exposed to music from Day Zero – from 'Day Minus' actually, because a child in the womb can clearly hear music, and picks up on things like beat.

So, if you come from a family where there's lots of music, and everyone's listening to it, playing it and dancing to it, then from the moment of birth you're already being programmed to respond.

If you look at the brain-scans of professional musicians, you find that they have areas of their brain that are much more heavily developed than the same area in somebody who's not a musician. In particular, the cerebellum and other parts of the brain involved in co-ordination – in

this case co-ordination of *movement* for, say, a violinist, who must get the fingers on the fret in just the right place.

But the same parts of the brain also control the co-ordination of *thought!* And studies have been done on this ...

MULTI-TASKING

If a child learns a musical instrument for a year, not only do her musical skills improve (both her listening skills and her playing of the thing) – but so, too, do her maths skills and reading skills at the same time.

GRAPEVINE: So these things are all inter-related?

SIMON ROWLEY: Right. Learning a musical instrument is very good for brain development, and I'd recommend that every child should be given that chance.

GRAPEVINE: How early should they start?

SIMON ROWLEY: Oh, I'd say from Day Zero really. As soon as they show interest.

GRAPEVINE: Are we still talking 'good-enough parenting'? We're not trying to turn our child into 'Baby Einstein' or 'Baby Mozart' are we?

SIMON ROWLEY: No. We're talking about *listening skills* to start with. So you give the baby periods of listening to music – and he might bounce and jump around. Babies love dancing and rocking and all sorts of rhythmic things. Then, at some point in the early years, you might offer the child the chance to pick up and play with a musical instrument ... the chance to enjoy and copy the parent. That'll grow out of what they're hearing.

But the ability – the 'musical ear', if you like – probably gets programmed in those

early months. So music is a really important way of developing the brain.

I think sport is important too. It also combines dance, music, rhythm ... those aerodynamic things where you're developing the part of the brain that involves co-ordination and movement ... and therefore *thought* as well.

GRAPEVINE: Isn't there a tension, though, between sport as a *competitive* activity and sport as a way of teaching kids *co-operation*?

SIMON ROWLEY: True. Some children seem really driven to succeed in competitive things, and others don't. It can be hard to work out what programmes might best suit your own child – but a certain amount of it's environmentally determined. If you're competitive parents, it's likely your children will pick up on that.

GRAPEVINE: So what's your advice to parents? How can they ensure that their babies get the right kind of stimulation in the right amounts at the right times?

SIMON ROWLEY: Well, most important is to have a warm, nurturing, loving relationship with your child. That attachment to the primary care-giver (or care-givers) is a vital developmental milestone for a baby. And it's usually made with just two or three people (at the most) – typically the mother and the father, but it could be a grandparent or an auntie or an uncle, or somebody else, perhaps a nanny.

That relationship's a mutual one, derived from the care-giving things that the adult does – like feeding, changing nappies, talking, singing, cuddling – and getting responses in return. And, as that relationship builds, it forms a bond that's the basis for all subsequent relationships the child will have in later life.



It's vital, therefore, that you develop a secure attachment relationship ... and that tends to start by about the age of six months. By eighteen months or so you may have moved past the ideal time, and it becomes much harder.

GRAPEVINE: How do you feel about the tendency these days for busy, working parents to drop their young children off to day-care?

SIMON ROWLEY: Well, frankly, if you're not being cared for by somebody who's got emotional investment in you, then the risk is you're going to struggle in this area.

DAY-CARE DANGER?

If, for the main part of the waking day, a young child is with a lot of different care-givers (as happens in many day-care centres and crèches), then that child never really gets a chance to establish a firm attachment relationship with his parents.

He gets cared for by people who have no emotional investment in him – which means he grows up (for the major part of each day, if his parents are away working) with someone who's just doing a job, keeping an eye on him, but not really caring for him in a one-on-one way.

GRAPEVINE: You're talking about those very early years – right?

SIMON ROWLEY: Of course. By the time he's two and three the child tends to be playing *alongside* other children – 'parallel play'. Then, from three onwards, the child tends to play *with* other children – interacting and using his relationship skills and abilities. In these later preschool years he needs the chance to go out and practice those skills on his peers and other people

– rather than being stuck in front of TV with a *GameBoy* or a video, where he's getting no feedback from a human face.

So when we say we're not happy about children in day-care, we're not saying that those latter years are a problem. We're talking about the early ones. It doesn't appear to be a good thing to have a three-month-old baby in day-care.

GRAPEVINE: Some argue the problem is really to do with the *quality* of the care given. If the child goes to a *really good* day-care centre, then the parents have no cause to worry. But does 'quality' day-care make any difference?

SIMON ROWLEY: Well, yes and no. The problem with day-care is that most centres have a *number* of people on staff who are assigned certain tasks: somebody will do the nappy-changing, somebody else will do the feeding, another again will do the greeting at the beginning of the day, while



still others are getting play materials ready, and so on. The child gets exposed to several different people in the course of the day – and the quality of that care varies according to the skills and experience of the individual people.

But the staff/child ratios are also important. If you've got a ratio of five children to one staff member, that's not good enough. Even the recommended ratios are still a bit on the low side, in my opinion.

However, of course, there are some situations where day-care is preferable to home ...

GRAPEVINE: Such as?

SIMON ROWLEY: Well, when the child's in an abusive home situation – exposed, say, to family violence. That's a really negative thing. It will affect the way the child's brain gets wired up, and you don't want that.

THE BEST SOLUTION?

So, to answer the question: a good day-care situation is obviously better than a bad home environment. But good and frequent interaction between parent and child in a good home environment is best of all.

GRAPEVINE: Does the length of time care-givers spend with a child affect the outcome?

SIMON ROWLEY: Yes, it does. And the same goes for the words a child hears. A child may develop poor self-esteem if he's constantly being told bad things.

Several quite convincing studies have looked at the number of words that people in negative situations say to their child every day ... compared to the words and vocab a child is exposed to in positive and reassuring households.

GRAPEVINE: “Good boy!” “Good girl!” “You did this really well!” – that sort of thing?

SIMON ROWLEY: Exactly. So we need to ensure we're making it possible for parents (one or other of them) to *be at home* for their child. Although, regrettably, our modern lifestyle doesn't help – it's not the way things tend to work out.

Most parents feel they need two incomes ... and nannies are expensive ... so it becomes very hard to balance things. And when Governments come out with statements like, “We're going to ensure that all mothers are working!” (even in the first two years of their child's life) ... you have to wonder if this is good.

GRAPEVINE: How many children are we talking about? How many children today are not getting enough of the right kind of care?

SIMON ROWLEY: Well, it's probably around 50%. And the worry is we're seeing an increasing number. Some parents have children – and then basically just pass their care over to other people, at a very early age. Some children are in day-care from as young as three months or six weeks!

That seems to me like a really bad thing to do for a child whose brain-development you're trying to optimise.

GRAPEVINE: It almost makes you wonder why some parents *have* children?

SIMON ROWLEY: Well, I've been quoted as wondering that – but let's not go there!

GRAPEVINE: What are the happiest outcomes you've seen in your career?

SIMON ROWLEY: One of the nice things about looking after pre-term babies is you take a baby who's very vulnerable – and, quite often, a parent (or parents) who are very vulnerable too. In the time

that the baby's with us (usually three or four months, when they're getting to the stage where they're healthy and they can go home) ... you not only look after that child, but you also look after the family.

Most of that sort of work is done by the nursing and support staff. Every time the mother comes in, they put their arms around her and ask her, "How are you?" "Is everything going alright?" "Do you need any help?"

And, quite often, the mother, who hasn't previously had that kind of supportive environment, will change. In those three or four months, she starts to grow into her role as a mother and really take that up. She might be a 16-year-old who's suffered abuse, but in this new role she finds she's now supported and nurtured. And at the end of that time she goes out a completely different person.

Those are the happy stories ...

GRAPEVINE: And the sad ones?

SIMON ROWLEY: Well, they usually feature people who are socially disadvantaged.

THE PROBLEM:

We get the baby through it ... and we support the mother through it ... but then they go home, back into that terrible situation, a situation that's just not compatible with a good outcome. And sometimes the babies really suffer.

We know, from our work with pre-term babies, that the social environment the children go back into is the most important thing in determining how well they'll do. It's not whether they had a very difficult time with a bleed in the brain, or punctured lungs, or a whole lot

of gut problems, or bowel perforations – although those all do happen. What really determines the final outcome, is the socio-economic status of the parent (or parents) and the family environment.

If they go home to a good environment, then that'll virtually overcome everything – all the merely physical problems. But if they go home to an abusive environment, the outcome's often very sad.

GRAPEVINE: I suppose the good news is: you can turn things around?

SIMON ROWLEY: Yes. That's when we feel we've made a difference. I mean, *anyone* can keep a baby *alive*. But what really counts is actually sending a baby home with optimism for the future ... and that optimism starts with the parents and then gets transferred to the child.

Whether the outcome is good or bad also depends to a great extent on society. And one of the ways we can interrupt that cycle of social deprivation is to teach kids how to be parents at an earlier stage. So the programmes where people go into schools and teach prospective parents what babies need and how to look after them – those give us most hope for the future.

Young people need to learn how to be nurturing and care-giving *before* they begin child-rearing. And that applies particularly to boys in our society. Boys need to learn to be tender and loving; to have feelings; to be able to cry when they're sad, and not to have to put up this tough, unfeeling mask on the outside.

GRAPEVINE: What's your advice to, say, a young woman who's suddenly found herself pregnant – assuming she's from a less-than-happy background?

SIMON ROWLEY: The first choice is for her to *celebrate* the birth of her child –



and to acknowledge that here's a new individual that needs caring and loving and supporting. This new baby *needs her* more than anything else in the world. And being needed is quite an important thing for people from this kind of background. Often they've not regarded themselves as having much value or worth.

I'd say to her: *Try as hard as you can to celebrate the birth and make it into a positive experience.* She probably won't find that easy, because there'll be financial pressures against her.

REWARDING?

We've got to help her view everything she does with that child in a positive light ... instead of regarding the child as a nuisance or a disaster or a mistake. Then hopefully, eventually, she'll get enormous rewards from mothering.

It's all about celebrating parenthood. The most important thing you can do with your life (if you decide to become a parent) is to *be a parent!*

Of course, it's also the hardest thing you'll ever do. And we're not very well trained for it!

GRAPEVINE: Is this the way ahead? Is this how we improve New Zealand's child-abuse statistics?

SIMON ROWLEY: Yes, I think that's the ultimate outcome. And we have an opportunity. If we can help families achieve 'good-enough parenting', raising children who are happy and safe and healthy and feel valued, we'll end up with a *society* where most people are indeed loved and nurtured – and therefore less likely to be criminals and do awful things to each other and their children.

The way to bring down the high rate of child-abuse and neglect we see today is to somehow get the next generation of parents being valued and supported. We've got to try and change the social setting and improve what's taking place. There are obviously cultural groups and social-class groups who are most vulnerable – and we've got to find a way to make them feel valued.

I think the way to change our society is to teach people how to nurture and love their children ...



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