

On reading, reflex and research

THERE is gentleness about Martin McPhillips. He leads me into his office where the pale-green walls are lined with photographs of children performing their routine of primary reflex movements. ‘They love it because it’s different from the cognitive tests to assess dyslexia,’ Martin smiles.

His interest in dyslexia developed when he became a special needs teacher in 1980, and in the following years he studied for a BSc (Hons) in psychology at Queen’s University of Belfast (QUB). Nowadays he works for the Dyslexia Project, a joint study between QUB and the Fetal Behaviour Research Centre at the Royal Maternity Hospital, Belfast.

Martin studied the various types of interventions available to children with dyslexia. ‘That took me off on many tangents,’ he laughed. Most of the assessment techniques and interventions were cognitive – pencil-and-paper type tests. ‘In truth the assessment technique

Could a simple exercise routine significantly improve the reading of dyslexic children? ANGUS SMYTH caught up with Martin McPhillips to find out more about the technique.

was working with the child’s weak spot and confronting the child with failure.’

Martin was interested in foetal movements, centring on the primary or primitive reflex system. From his observations, he had a hunch children with dyslexia might have held on to primary reflexes, unlike non-dyslexic children. ‘Well over 70 primary reflexes have been identified,’ he said. Martin paid particular attention to the asymmetrical tonic neck reflex. This is elicited by a sideways turning of the head when the baby is supine; the response consists of extension of the arm and leg on the side to which the head turns, and flexion of the opposite limbs.

David McGlown and Peter Blythe’s work in Chester studying baby movement grabbed Martin’s attention. In America Jean Ayres had set up the integration of movement with babies and children. Martin found his empirical base from these UK and American studies. ‘The study needed to be as pure and scientifically grounded as possible. What does the foetus really do? Was it an extension of what had gone before?’ he explained.

To the best of his knowledge Martin believed that no one had actually studied foetal movements before. An assumption existed that foetal movements were random movements with no real purpose to them. Moreover, researchers are limited as they try to work out what the foetus is up to, because scanning equipment operates in a two-dimensional mode.

Martin and his colleagues observed hundreds of pregnancy scans at the Fetal Behaviour Research Centre at the Royal Maternity Hospital, Belfast. From the evidence viewed on the scans it appeared that the foetus was making all the classic reflex patterns documented in the standard paediatric textbooks. ‘What we did see was

very encouraging,’ Martin said. However, it appeared that the foetal movements were more stereotyped than those of a newborn. The scans showed how the primary reflexes appeared to resemble an unfolding of preloaded programmes as foetal development took place. ‘The foetus appears to have a reciprocal interaction with the central nervous system – the CNS – whereby the primary reflexes aid and facilitate the development of the central architecture of the CNS. It’s not an offshoot of the CNS.’

It had long been established that children with a learning difficulty and dyslexia have reflex problems. ‘What seems to be happening is that during the development of the foetus these reflexes play a critical role. Then, following birth and by about one year of age, most individuals inhibit or transform the primary reflexes into different movements. People with dyslexia do not.’

Primary reflexes allow the foetus to function in the fluid environment of the womb. The newborn then has to adapt to a dry environment and a new horizontal position. As the infant becomes upright, a different system takes over, allowing it to walk around. Martin described the primary reflex system as being like the caterpillar stage in human development that switches over to the secondary or postural reflex system at approximately one year of age.

Some primary reflexes have been well documented, such as the palmar reflex, whereby a baby will grasp your hand if you place your finger on its palm. Under certain disease conditions the primary reflex system could emerge again – sometimes in multiple sclerosis or Alzheimer’s disease. ‘Really the primary system cannot be deleted, because it is a core part of the CNS,’ Martin explained.



Martin McPhillips performing an eye-tracking test

As we move from the flat world to the vertical world, our secondary system starts to emerge slowly and overlaps the primary system. The secondary reflex system allows people to orient to the world in a different way. 'None of us have to consciously think about where up and down are,' Martin said.

However, astronauts have to learn to adapt to a non-gravitational world. 'They make a lot of dyslexic-type errors,' Martin continued. Back on earth, humans are not consciously aware of viewing the world in left and right. 'People develop a kind of three-dimensional grid that they operate within. If you take gravity out of the grid, then ordering becomes more difficult,' Martin said, moving imaginary objects in front of him. 'Everything starts to shift. This is the trouble faced by dyslexic children, because as long as the primary system is there it won't allow you to develop the grid system.'

The Dyslexia Project used a technique that took the primary reflexes out of the equation – it switched them off. Martin taught the children the primary reflex movements. The routine looked a bit like a form of t'ai chi. The movements are very deliberate and slow, keeping to the stereotypical patterns of the primary reflexes. 'The core issue is to use the primary reflex itself, to switch itself off. This is achieved by mimicking the reflex patterns. When the child with dyslexia performs the reflex in the exercise routine, the CNS appears to say "OK, now you have given me what I wanted", and it inhibits further reflexes. With a neonate it appears the more the baby performs the reflex the greater the likelihood it will switch off the primary reflex,' he explained.

Once the children had performed the movements, their reading improved significantly (McPhillips *et al.*, 2000). They could focus on the page and attend to the task in question much better. The child's ability to co-ordinate pen and paper is greatly improved. 'Naturally, the child's confidence and self-esteem receive enormous boosts and just like other children who go to school and succeed, the dyslexic child begins to feel good about their achievements.'

The children who took part in the formal study were aged 8–11, all had been failing at school and all had been referred to educational psychologists. Martin and his team had deliberately chosen a group of children that would be hard to change so that spontaneous recovery could be avoided. 'They were very negative about

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another person poking and prodding at their weak spot,' Martin said. However, many of the children who had completed the routines talked of the immense change they had experienced. The children talked of how the world had become stable; objects had stopped moving about. 'It has a novelty benefit for them because it is an entirely different type of assessment and intervention.'

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According to Martin, assessing the children with dyslexia is quite easy. This is achieved by observing the exercise routine. One of the diagnostic movements involves getting the child to hold their hands out in front of them. The examiner moves the child's head to the side and if the child's arms move this is a strong indication of the primary reflex's existence. The team used varying degrees of movement to determine how strong the primary reflex was – eye-tracking tests were also used.

When the primary reflexes were demonstrated to teachers and parents they were astounded. The children had been expected to perform very refined motor movements in school, such as following words on a page or holding a pencil. In reality they could not perform very basic tasks. Martin pointed out it was very unfair, on both the child and the teacher. First, there is a basic assumption that all children commencing school start with the same ability to perform these tasks. Therefore, when children fail, the school or the teachers are used as scapegoats. Secondly, blame is usually pointed at the child's home because of a perceived turmoil

existing there. 'These assumptions need to be addressed because for a significant number of children this is not the case,' Martin stressed. Moreover, boys seemed to have a weaker CNS and displayed more primary reflex problems – with an approximate ratio of 3:1 over girls.

Martin hoped all children entering primary school could be given the chance to perform the exercises as part of their PE programme. This way, children with dyslexia could be picked up and helped. Martin was quick to point out that not only dyslexic children could benefit. It is estimated that 5–10 per cent of school-age children have a learning difficulty, but many other children have varying degrees of primary-reflex disruption within the school population: '...not at the same level as the learning disability population, but it would be disrupting the child's learning.' Such children would perform reasonably well and would be capable of passing examinations, he figured. However, if inhibition of the primary reflexes were introduced, they would function at a much higher level.

The applied value of Martin's work is immense. Inhibiting the primary reflex system seems to apply across the lifespan. Therefore, a person with dyslexia who is 70 years old can perform the exercises. 'It may take a little longer, but they can recover and benefit just as much as a child.'

One would expect research grants to be pouring in for Martin. 'No,' he smiled. The Dyslexia Project had been turned down for funding by numerous bodies. 'We seem to fall between two stools. The programme is too medical for the educational grants and too educational for the medical grants. Also we are coming at learning from a different dimension.'

In that case will I see Martin McPhillips brushing the streets of Belfast next week? I asked. He smiled and told me the job security would be welcome. The study was only possible because of funding from the Peter F. Smith Charitable Trust. 'Quite a few times I have come into the office and started to pack my bags because I could not see a way of continuing. Sometimes I wondered should I just give up and move to steady employment. My wife and two children noticed I was a lot grumpier,' he smiled. However, seeing the kids do well makes it all worthwhile.

Reference

McPhillips, M., Hepper, P.G., & Mulhern, G. (2000). Effects of replicating primary-reflex movements on specific reading difficulties in children: A randomised, double-blind, controlled trial. *The Lancet*, 355, 537–541.