

THE BALSALL COMMON SCHOOL STUDIES.

After discussing with the British Dyslexia Association's (BDA) research advisor Dr. Lindsay Peer (2000) about how we should properly research the effectiveness of the DDAT treatment we were advised to firstly seek an independent assessment, preferably via a university and show how the treatments impact on a selected group of children with evidence of learning difficulties. Secondly to use a control group. Thirdly to follow up the groups to see if the effectiveness of the treatment 'washed out' as do other types of treatment when the programme had finished. Finally to look at large numbers of people to see if these results are reflected when applied to larger numbers going through our centres.

This study started in September 2001.

We asked two independent researchers from two different universities to join forces and assess the DDAT programme independent from DDAT using school based measures.

Professor David Reynolds, Professor of Education from Exeter University and

Professor Rod Nicolson, Professor of Psychology from Sheffield University

joined forces and so began this fascinating project.

Important points to make about the children in the Balsall Common study

- **From the initial screening of the school 20% of children showed some problem with learning. Much higher than most studies suggest**
- **Less than one third had been previously identified**
- **The children in the study did not receive any more teaching help during the study than they had done before the study had commenced.**
- **The teachers were not aware which children were in the study or who was in the treatment or control group**

- The assessments in reading and SATs were done independently of DDAT along with the rest of the school
- We used the pupils screened and not showing any risk of dyslexia as a control group to see how effective our intervention was

Important points to make about the first Balsall Common research paper

- Reassessments were made of dyslexia risk after only 6 months and for SATS results after 11 months on the programme.
- Children on the DDAT treatment made much greater progress than controls and also with their previous performance before DDAT.
- In the treatment group reading age improved by nearly 4 times the previous rate (20 months in 9 months compared to 5 months in 12 months the previous year.
- Comprehension increased by 5 times the previous rate of improvement in SATs
- Writing improved by 17 times the previous rate in SATs
- Dyslexia severity reduced much more in the treatment group than the control (delayed treatment) group. Strong risk scores for dyslexia reduced by two thirds in only 6 months.
- There were huge improvements in balance, coordination and fine motor skills to normal levels in the treatment group.
- Subjectively all treated children reported much greater attention and concentration, happiness, self-esteem, friendships, and sporting ability both during and a year after completing the DDAT programme

Important points to make about the Second Balsall Common research paper

- **Control subjects now become treatment subjects and see the same benefits on the DDAT programme as the first treatment group**
- **Both groups see continued progress even after the DDAT programme has been completed. The effects seem to be permanent**
- **The progress made after stopping DDAT treatment is greater on all the measures taken by the school than before the programme**
- **The progress in SATs made during and after stopping the DDAT programme is between 25%-40% better than the rest of the year groups who have no learning problems. Even in mathematics. This has never been shown before and is described by Prof. Reynolds as 'remarkable'**
- **Both groups 'catch up' and reach the expected reading level for their age groups. Again something not usually seen with any other type of intervention**
- **Those with the most severe dyslexia risk make the greatest progress and show only borderline mild risk a year after being off the DDAT programme. Most interventions are less effective the more severe the dyslexic tendencies are**
- **The severe risk group have improved so much a year after the programme has finished that they would now not be eligible to take part in the study due to the lack of sufficient dyslexia risk**
- **Those with moderate or mild risk of dyslexia also make good progress and now show 'no risk' of dyslexia after a year off the DDAT programme**
- **Fluency, phonological and memory tests which were below the normal range for the whole group at the start of the study are now well within the average expected range. These rarely ever improve even into adulthood**
- **Tests for evidence of AD/HD showed that 50% of our subjects had sufficient criteria to have an AD/HD diagnosis. This dropped to 0% at the end of the study (a year after finishing the programme)**

- **No child who fully completed the programme required any further special needs help a year after the intervention had ended.**
- **These results were from the use of standard school teaching methods. These methods are usually shown to be ineffective by most researchers in normal circumstances.**

The Balsall Common Study.

Now most studies will only look at reading ability to assess an intervention for learning difficulties (LD). They will only compare to other similar LD controls and they will rarely look at the long term effectiveness on reading.

We took a different approach. We decided to screen whole year groups for dyslexia at a single school until we had enough subjects. This ended up as 3 year groups. We found only one third had been previously identified and only a few were receiving any external support.

We also decided to look at more than just reading, so we looked at coordination abilities, attention, memory, speed and fluency, comprehension, writing skills, maths skills, and I almost forgot, reading.

We were sure, having already seen thousands of people at our centres, that most of those we saw were not just struggling with reading skills but had a range of difficulties. To really assess a group we believed it was vital to test all these areas of function. Not just the ones which we think we might improve!

The only way we could secure a control group was to allow a cross over trial where half the subjects were held back for 6 months. We had a treatment we had seen working very successfully on thousands already so we could not deny that to a group of youngsters struggling with learning. Not for very long anyway.

This group of identified children were split on the basis of their dyslexia screening results at the start into a treatment and a delayed treatment group (control).

The plan was for the treatment group to start the DDAT programme first, followed six months later by the delayed group. We would assess them annually for their reading scores and all the SATs tests (maths, writing, comprehension) which were performed by the school every July on all pupils before the summer break. And every six months with a range of tests assessing dyslexic difficulties and risk level. We also assessed their coordination and balance skills with a battery of tests. Each child received an assessment of attention and activity symptoms to look for risk of AD/HD (called DSM1V). They also recorded for us their subjective feelings of change after the programme had finished.

This research was written up, peer reviewed and published in the journal Dyslexia in February 2003.

The publication findings showed dramatic changes across a whole range of measures. Significant improvements were found in coordination, fine motor abilities (eye tracking, writing skills, fine finger control), gross motor skills (posture control and balance), reading (average 20 months progress over 9 months on the programme), comprehension (5 times progress in SATs of previous year), and writing skill (17 times more progress in SATs than the year before).

**The results of this initial research prompted Professor Rod Nicolson to say in the research paper conclusions-
'the results do suggest that the exercise treatment was effective, not only in its immediate target of improving cerebellar function but also in the more controversial role of improving cognitive skills and literacy performance'**

As I mentioned earlier we wished to go further and show that not only were these dramatic improvements sustained but the rate of improvement would carry on until they reached the expected levels for the age groups. So we asked Professor David Reynolds to assess all our subjects over the second and into the third year to see how these changes had been maintained and to see if they continued to improve without therapy from DDAT.

It was also suggested that we should look at academic performance in the rest of the school who, having already been screened for dyslexia and excluded (the positive dyslexia group formed our research groups), were a selected group of non-learning impaired children having the same teaching input. This was to preempt some academics suggesting that the improvements might be due to the schools teaching methods. We must stress however that this possibility never seems to be assessed in the majority of studies of reading intervention effectiveness.

Trevor Davies (Headmaster) also reported back to us that he had noticed substantial improvements in behaviour and attention in many children in the research groups. We therefore decided to repeat at the end a reassessment of

the levels of attention and activity problems in both groups and compare them to their initial assessments. (This was done independently of the research study from our own data).

The 2nd Balsall Common study paper was presented at the BDA International conference in March 2004 by Professor David Reynolds.

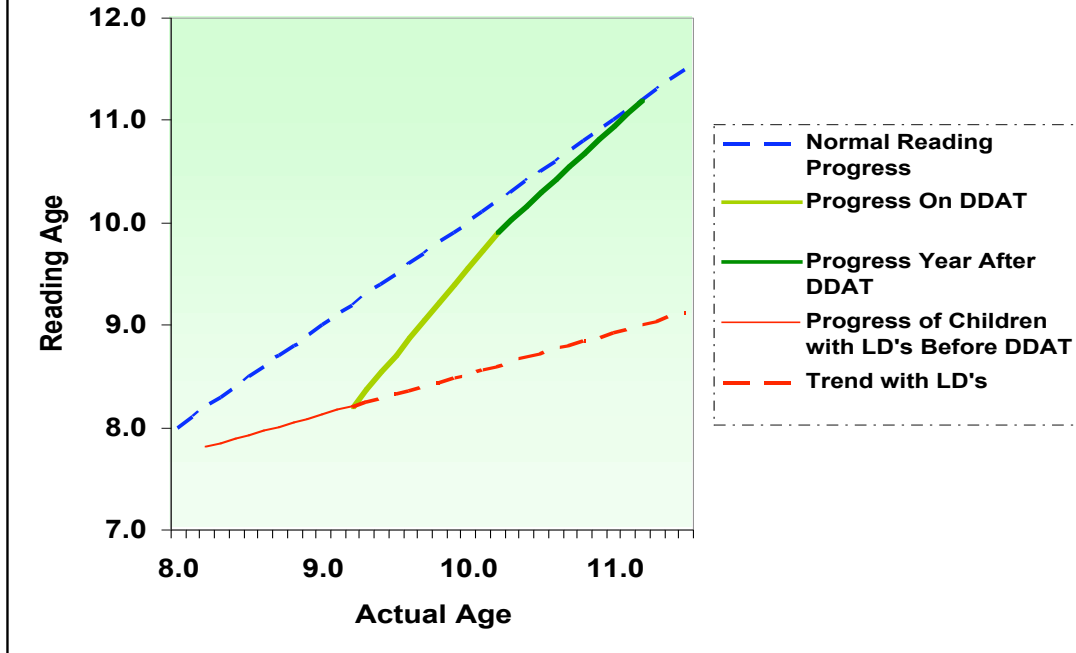
This paper like the first paper can be seen on the DDAT (Dore) website in its original form.

There are a number of key messages to highlight from this paper.

We saw not only sustained levels of improvement in SATs and reading skills but the same increased level of improvements way above those which were evident before subjects embarked on the DDAT (Dore) programme, and greater than their normal learning peer group, even when the subjects were no longer receiving any intervention. This rather dismisses earlier claims of a placebo effect from the treatment. It means that not only does the intervention have dramatic improving effects on learning during our programme but this effect is sustained long after the programme has been completed. It appears so far to be a permanent effect. This is unprecedented in any research on the long term effectiveness of any intervention in dyslexia or other learning difficulties.

'Many children in this study by now have moved up to secondary school (at age 11) and have no further requirement for special needs support'.-Trevor Davies Headmaster Balsall Common School, 2004

Balsall Common Study - Effect of Dore / DDAT Program on Children with Learning Difficulties



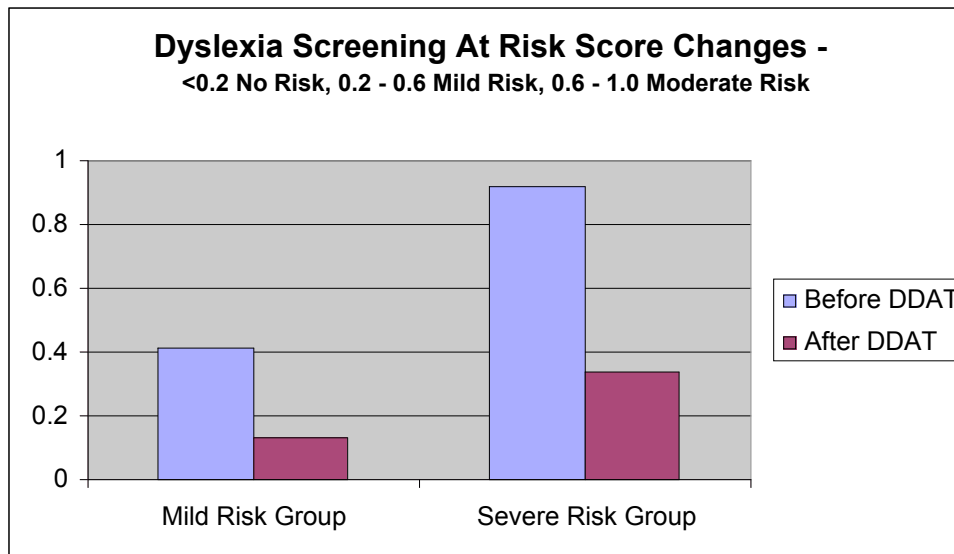
This graph shows firstly the reading progress of our subjects (red) before treatment 2000-2001 (this was as expected around 6 months per year). Then the dramatic improvements in reading in the first year on treatment between 2001 and 2002 (light green). Finally followed by the continued improvements in 2002-2003 after DDAT(Dore) treatment has ended (dark green).

The dotted red line is what would have happened without DDAT(Dore) treatment. They would have been more than 2 years behind in reading at the end of our study. The dotted blue line shows the normal expected reading progress of a child without reading difficulties. Note how the dark green line crosses the blue line. This shows that our treatment group caught up with their normal expected level of reading for their age. They were no longer showing reading delay.

Improvements were also noted to be much greater in the most severely dyslexic subjects. Again this appears to be unique to the DDAT (Dore) programme. For example the recent Dyslexia Institute (DI) Spellit study 2002 showed that their treatments were the least effective in those most severely 'dyslexic'.

The authors quote that 'the treatment is particularly effective in increasing reading for children with high DST (Dyslexia risk) scores and poor initial reading.'

- In the Journal Dyslexia, Feb 2003.



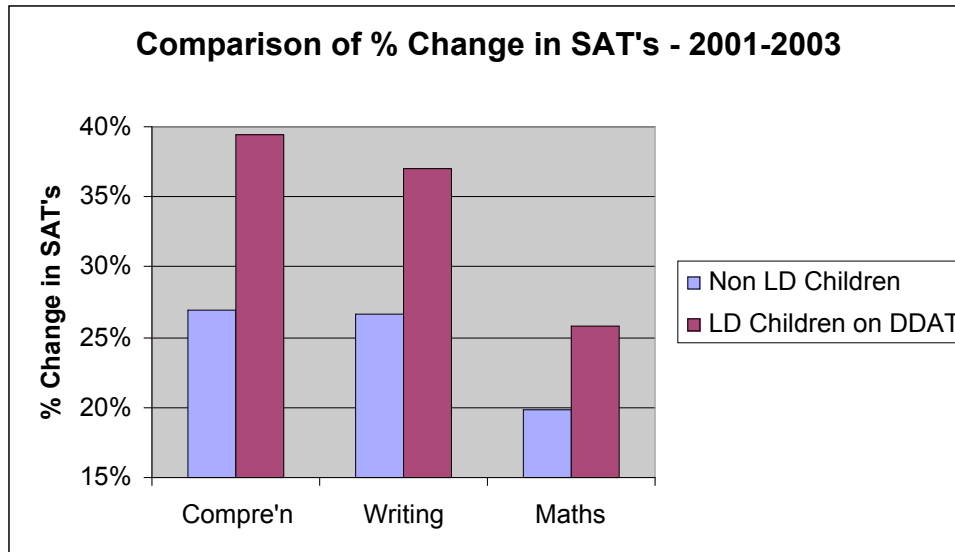
This graph shows all our study subjects split into severe risk and mild risk groups. Note firstly that the severe risk group improve twice as much as the mild group and move into the mild/borderline risk area for dyslexia. Also note how the mild risk group fall below 0.2 indicating there is no longer any evidence of dyslexia. These changes were measured a year after the DDAT (Dore) treatment ended so can be considered a permanent change.

As these improvements occurred long after the intervention had ceased then these can be considered permanent changes.

We are also seeing huge improvements in attention sustained a year after the end of the programme. The combination of both improved cognitive (learning) abilities and attention abilities has undoubtedly led to these large and sustained improvements in reading and SATs performance.

We also compared our research subjects with the rest of the school pupils (without learning problems or dyslexia risk) in progress in reading, maths, comprehension and writing. This was done both during the programme and the year after the DDAT (Dore) programme had been completed. There was consistently better progress in our research subjects in all the above measures with between 25 and 40% greater progress than normal learning school peers. The expectation has always been from prior research that it was impossible for children with learning difficulties to exceed the progress of their unaffected peer groups.

“On all achievement measures, this group of children with learning difficulties gain *more* than their age peers without such difficulties, a remarkable finding”- quote of Professor David Reynolds BDA conference 2004



This graph shows how our research subjects with learning difficulties compare with the rest of the school (without learning problems) matched for age. Along with the reading changes outlined before there is much greater progress in comprehension, writing and maths (which were the only SATs measures normally taken at the school). A huge achievement.

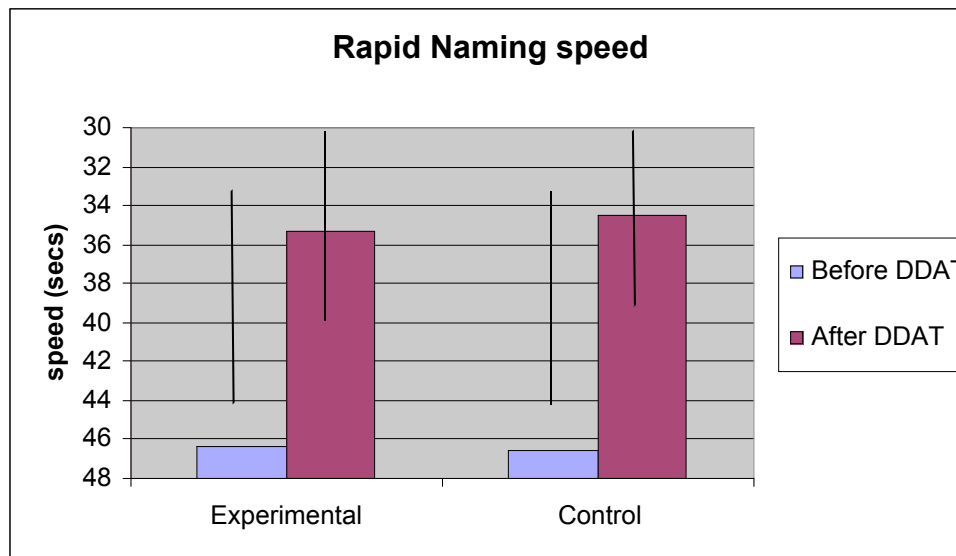
As part of the study we examined a number of tests of skill. These include many of the skills found to be quite poor in dyslexic subjects. We assessed these tests all the way through these studies. What we have found is quite remarkable. Generally these skill problems reflect an ongoing problem for dyslexics even into adulthood. They are shown to be poor even in those dyslexics gifted enough to achieve university places. These include rapid naming skills, phonological segmentation skills; non-word reading skills and digit span (working memory) skills.

We examined the results of these tests both before the DDAT (Dore) programme commenced and a year after it had been completed. There were three skill tests which were consistently poor and below the 'normal range' in the study group at

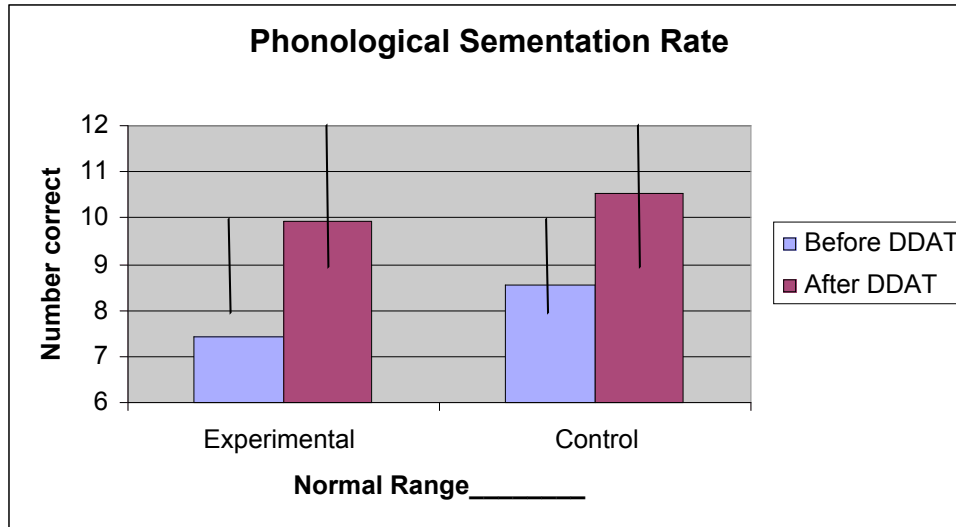
the start of the programme. Those were rapid naming, phonological segmentation and backward digit span. They measure naming speed, phonological skills and working memory skills respectively. These are three key skill areas needed to be able to develop good literacy ability.

A year after the programme had been completed all these skills had improved to well within the normal range. In addition some skills like semantic fluency (accessing memory), writing, and bead threading (motor skills) improved so much they exceeded the upper limits of the normal range at the end of the study.

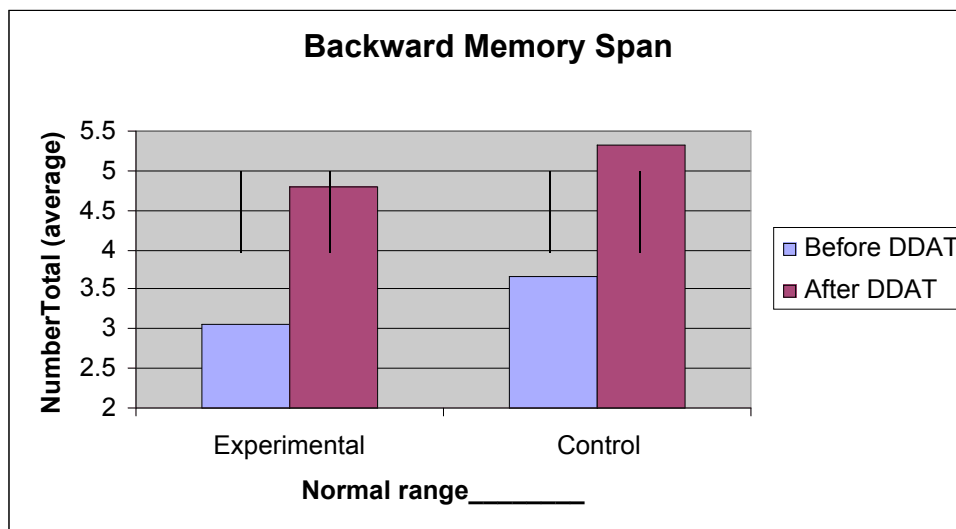
Professor Rod Nicolson states that- ‘In summary, there does appear to be clear transfer of the DDAT intervention to most of the fundamental cognitive skills underpinning literacy skill, especially those involving fluency’.



This graph shows how naming speed has improved from well below the normal range at the start of the programme to well within this range a year after stopping in both experimental and control groups. (The black line is the normal range)



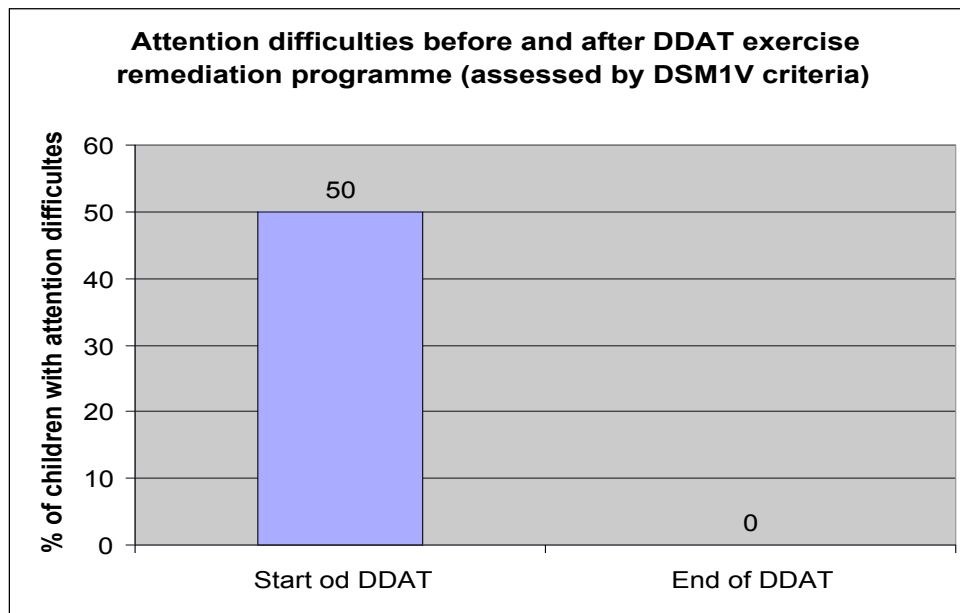
This graph shows phonological segmentation skills. This is the ability to mentally remove a letter or letters from a word and say what word the remaining letters form. The experimental group were worse and below the normal range. Both groups improve relative to the normal range. The experimental group move into the normal range.



This graph shows backward memory span. This is the ability to hear a list of numbers and then repeat them back to the tester in reverse order e.g. 3,2,1 reversed would be 1,2,3. Both groups are below the normal range to start and are at the upper level of the normal range a year after the programme has been completed. It assesses working memory and is usually always very poor in dyslexics. Improving this will have significant impact in learning.

Another concern for us was the level of attention and concentration difficulties found in our subjects. Obviously attention and concentration is vital to keep on

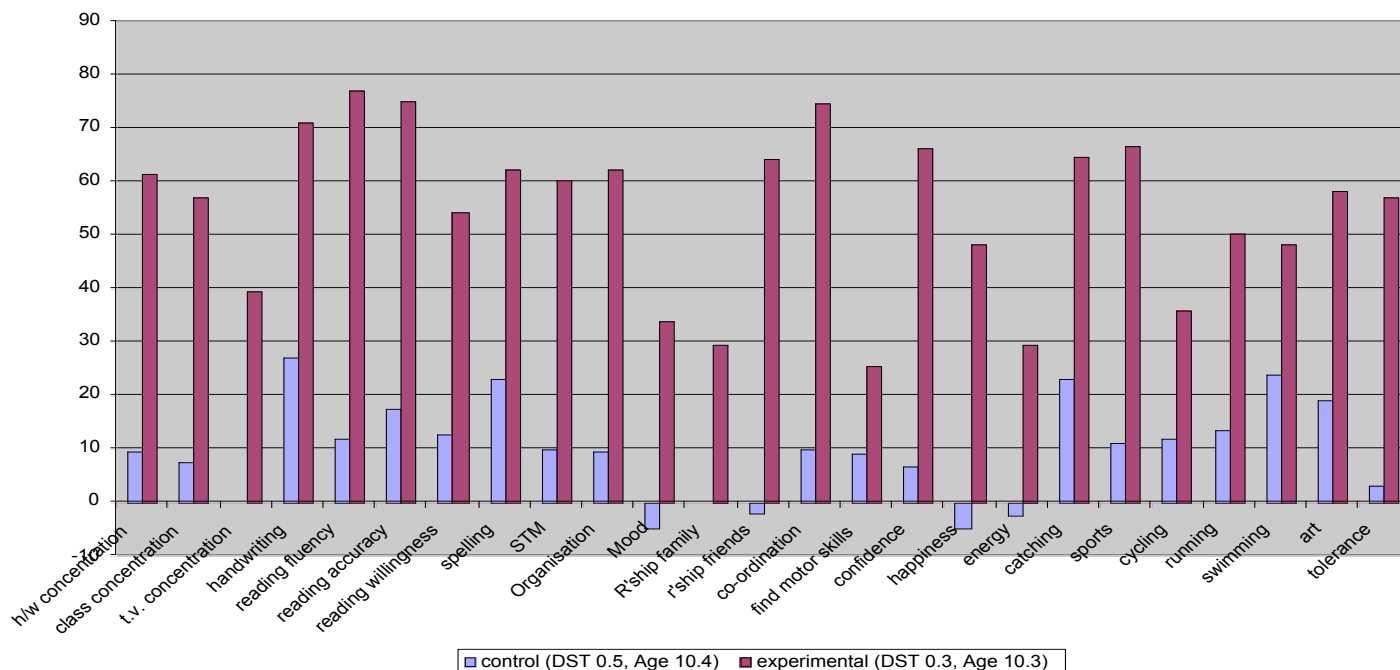
task and respond to teaching intervention. If this cannot be done it doesn't matter how good teaching might be. For example the Dyslexia Institute Spellit study showed conclusively just how poor attention was in their poor reading groups. One would expect full concentration to be at about 75% in normal circumstances. In poor learners it was more like 25%. This will impact significantly on learning. A child who is struggling with literacy requires more exposure to teaching not less. Our measure of attention, concentration and activity/impulsivity measures (DSM1V), which reflects the ability to focus and maintain attention, showed a quite remarkable change. Initially 50% of our group showed signs of AD/HD; this had reduced to 0% a year after finishing the programme. This suggests a permanent change in levels of ADHD in our group.



This graph shows the level of attention problems in our research subjects at the start of the programme using DSM1V. This is used by most specialists to identify risk levels of AD/HD. We found 50% of the children in our research group had a positive suggestion of this before treatment which dropped to 0% a year after the programme was completed. The consequences of this were much better behaviour but more importantly an increased ability to keep attention in class and therefore to respond to teaching and therefore learn more rapidly.

These measures are all well and good but how did the children themselves feel. We asked a large range of questions relating their day to day performance and feelings these included self-esteem, mood, confidence, sporting ability and a lot more. The graphs above show just how much these children were changing, the graph below shows how they felt they themselves were changing.

Subjective changes seen between Sept 2001 - August 2002
Groups are matched for gender, age and DST 'at risk' score



This graph shows how the experimental group had changed on the programme compared to the control group before starting the programme. There are considerable subjective feelings of improvement in every section.

Conclusions

What can we conclude from this fascinating study?

We have shown how effective a non literacy based programme can be in improving all the symptoms of the most common learning difficulty labels. We

strongly believe that children and adults with specific learning problems have more than just a reading difficulty. We therefore believe that to achieve significant improvement one must address the whole problem.

DDAT (Dore) believes that there is now a wealth of knowledge around the world to show that there are not separate labels distinguishing people with specific learning problems but the majority have a whole range of difficulties encroaching into literacy, attention, memory, mood and motor control. Some of these improve over time faster than others depending on how difficult it is to improve the skills in these areas. Some symptoms are worse in some than others. This is called comorbidity and we presented data on this subject at the BDA conference on over 4500 clients attending DDAT. It basically showed that 67% of our clients show evidence of overlap on all three of the different diagnostic categories of dyslexia, dyspraxia (DCD) and AD/HD.

We also strongly believe that the cerebellum (hind brain) is the basis of most if not all of these symptoms. Poor development and communication with the cerebral cortex (thinking brain) results in severe difficulties developing skills and then making many of these skills automatic and 'subconscious'.

By targeting the cerebellum rather than teaching mechanisms per se we are effectively reaching the root cause of these learning problems. Improving cerebellar function (as shown above) not only improves learning skills, memory and attention so vital in the processes to acquire literacy (reading and spelling etc.) but also impacts on other areas involved in emotional control (self esteem, mood etc.) and coordination skills (writing skills and sports).

The outcome is as described, with a huge leap in the ability to develop literacy skills in response to good teaching practice as well as other beneficial effects on coordination, attention and mood. We are literally changing the ability to learn, communicate and automatise skills.

These changes are sustained even when the 'treatment' was withdrawn indicating permanent effects on learning capabilities.

'No other phonological or other program has ever in my experience had as much impact on the learning process of children'- Trevor Davies, Headmaster at Balsall Common School, 2003

It is important to understand why the programme has been so successful. Many do not immediately understand how exercises could have such a huge impact on learning processes and so dismiss this as some placebo effect.

The key lies in what is actually the underlying problem in these types of learning difficulties. Is it poor teaching? No. Is it the ability to respond to teaching? Yes.

Fundamentally, as the name implies, LD children by definition have a problem in learning. Ideally the solution is to improve a child's learning capability. Most approaches to LD are to provide more structured and individualised teaching on top of the existing teaching input. However if learning is flawed then teaching will be much less effective, however good it might be. This is exactly what is happening. Excellent teaching strategies are having limited impact and unsustainable effects when withdrawn because a child's learning ability or capacity is not being improved.

The best way to get this message across is to use an analogy. When a car tyre has a puncture one can keep pumping the tyre up until it is inflated but gradually it deflates and requires further air. The bigger the leak the faster one needs to pump or the bigger the pump has to be. This is hard work and requires continuous work. The tyre is the child, the tyre pump being the teaching mechanism and the air being the knowledge imparted. The hole in the tyre is the learning difficulty.

If there were no hole then less air is needed to be pumped into the tyre (less effort by the teacher). What is ideally required in LD is the ability to repair the hole first, and then pump up the tyre. The tyre then stays inflated and needs no special attention other than check the pressure and keep it topped up. This can be done with conventional teaching methods (as with the Balsall Common study) or fast tracked using specialised teaching mechanisms on top (i.e. the numerous teaching strategies available for LD).

So we at DDAT (Dore) feel we are addressing the fundamental area of learning. We are actually repairing the hole in the tyre. The success of this approach is made quite clear from the results of these studies.

The fact that we are improving significantly to a normal range the underlying skills without actually specifically training those skills indicates how powerful the effect of this treatment is.

The fact that these skills remain normal a year later shows it is not a placebo effect and the underlying ability to learn is retained. Again this is confirmed by the continuous progress made by our research subjects even without the treatment. It appears to be a permanent effect.

Fixing the learning first is the most logical approach so that you or your child might gain the greatest benefits from any teaching process or even just to improve poor skills in the workplace.

Most parents are worried that their child with learning difficulties is falling further and further behind at school using normal teaching methods. They struggle and often battle to get extra help only to find that the help is not as effective as they expected. This process alone often takes years.

At DDAT we now have conclusive proof that our programme has a major impact on learning capabilities so that response to teaching in a standard school environment is exceptional and sustained. For the first time in any study these children caught up and now are achieving at the level expected for their age group, well after the treatment had finished.

Dr. Roy Rutherford

Medical and Research Director

DDAT(Dore) Centres UK.