

The following article was published in
SEN Magazine
the UK's leading magazine for special educational needs



For a **FREE** trial copy of SEN Magazine,
[click here](#)

SEN Magazine Ltd. Chapel House, 5 Shawbridge Street, Clitheroe, BB7 1LY
Tel: 01200 409800 Fax: 01200 409809 Email: subscribe@senmagazine.co.uk
www.senmagazine.co.uk

Five ways to understand dyscalculia

*New research may shed light on the different types of problems dyscalculics have with numeracy, says **Tony Attwood***

During 2012, the results of 300 online dyscalculia tests taken by children and teenagers aged between eight and 18 were analysed in an attempt to reveal patterns which might allow different types of dyscalculia to be identified.

Dyscalculia is a deep-rooted inability to understand and undertake mathematical calculations. The word dyscalculia is normally reserved for people whose mathematical problems arise because of a genetic malfunction. As such, dyscalculia may be seen as the mathematical equivalent of dyslexia. Just as dyslexic people need help with reading, often utilising very different methods from those used in the general classroom, so dyscalculic individuals need special help.

Types of dyscalculia

As a result of this analysis, undertaken by the Dyscalculia Centre, the proposition has been put forward that there are, in fact, five different types of dyscalculia. These are described, for the first time, below.

Type 1 dyscalculics report significant worries about their maths and are very poor at completing basic maths tasks which 90 per cent of people of the same age could do.

In effect, because of their dyscalculia and because they have either received no support or the wrong type of support to help them overcome their difficulties, they have failed to learn any strategies to help them do maths even at a basic

They cannot imagine what “five minutes” means any more than they can grasp how long a millennium is

level. As a result of this combination of difficulty and lack of support, their self-doubt appears to make their difficulties even greater. A feeling that “I can’t do maths” takes over and actively prevents remedial work.

Type 1 dyscalculics may grasp the four basic functions of maths but generally find that more advanced concepts such as fractions are completely meaningless to them.

As such individuals tend to feel themselves to be living in an alien world that makes no sense, anxiety and concern tends to grow. Everyone around them seems to “get” maths, but they don’t, no matter how often it is taught to them through conventional means.

Type 2 dyscalculics also experience a deep concern about their maths but have found strategies for understanding and coping with basic mathematics. These people may not be able to pass GCSE maths at grade C but they have enough mathematical knowledge to get by on a daily basis. They can generally operate a calculator and appreciate how the basic functions of maths work.

However, when asked to undertake mathematical calculations, they can

often find themselves taking two or three times as long as non-dyscalculic people of the same age and intellectual ability and this becomes a constant reminder to them of their “difference” in relation to maths.

Thus, like Type 1 dyscalculics, they retain a deep embarrassment and worry about their condition. However, unlike Type 1 dyscalculics, the Type 2 individual will often believe his/her disability is much greater than it is, because the individual is extremely aware of how slow s/he is at basic maths.

Type 3 students have a profound difficulty in comprehending and dealing with the concept of time. This may be combined with the conditions revealed in Type 1 or 2 individuals, but it is the problem with time that distinguishes them.

This temporal difficulty is not just a problem in coping with the 24-hour clock, which many dyscalculics express, but relates to something far deeper. For the Type 3 dyscalculic, the notion of time simply doesn’t make sense. They cannot imagine or estimate what “five minutes” means any more than they can grasp how long a millennium is.

Individuals with Type 3 dyscalculia invariably also have a short-term/long-term memory problem, as well as sequencing difficulties. Typically, they will find it hard to describe a series of actions (for example, for the running of a bath) as a sequence, and will either put actions in the wrong order or will

omit some fundamental issues from the sequence completely. Correcting the Type 3 individual and then asking him/her to run the sequence again rarely results in any improvement.

Type 3 is much rarer than other types of dyscalculia but for those who suffer from it, day to day problems can be huge.

Type 4 dyscalculics turn out not to be dyscalculic in the strictest sense, but are in fact people who display many of the symptoms of dyscalculia because they have short-term and long-term memory problems, combined with a home life in which the value of maths has not been appreciated and has not resulted in a desire to learn maths.

Typically, these individuals may not have been recognised as having a memory problem at school, and may well have been told at home that maths was not important. A parent may have said something along the lines of "I could never do maths at school and it never harmed me."

While such statements may well have been made with the best intent, they can, in many cases, undermine any subsequent attempt to help the young person overcome their difficulties with maths.

Type 4 students are recognised by their inability to remember sequences of numbers, such as their telephone number, because of their difficulty in finding a way to move sequences of numbers from the short-term to the long-term memory. Thus, numbers and sequences get lost, and any calculation involving two sets of numbers in which one conclusion has to be remembered while the second is calculated, is liable to be highly problematic.

Type 5 dyscalculics are people who do not see numbers as in any way related to the real world. In a sense, most of us have this. After all, what is "six"? (We

Type 5 dyscalculics do not see numbers as in any way related to the real world

know what six sheep are, but what is "six"?) Most of us, however, set this aside and work happily with this strange concept. Some people can't or don't do this, though, and continue to be puzzled by numbers and their meaning.

People with this condition can get by in maths, if they have special tuition, but always find fractions difficult, because they can't grasp the concept of "half" or "quarter". Thus they might learn how to add fractions, but the whole operation remains mechanical, and has no relevance to the world they live in.

Such individuals, if asked to add $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$, might well write "4/4" as the answer. Some might then have learned the rules for handling maths to such a degree that they then reduce this answer to "1", but it is a mechanical process, rather than one that starts from imagining a piece of paper cut into quarters, and then immediately seeing what it means to put the four pieces back together. In short, the addition of the four quarters does not have the same meaning as it does for most people.

It is important to remember that the results and analysis of the Centre's research are not definitive, but I believe they represent a useful first stage in the search for a comprehensive classification of dyscalculia. There is, though, a long way yet to go before we have a full understanding of this condition. **SEN**

Further information

Tony Attwood is the founder of The Dyscalculia Centre:
www.dyscalculia.me.uk