Journal of Inclusive Practice in FE and HE

Issue 2, Autumn 2009

Neurodiversity

Editorial

Issue 1 of this Journal was focused on the characteristics and experiences of individuals on the Autism Spectrum. This edition looks at a broader range of neurodiversity.

The term ‘neurodiversity’ was coined by autistic people in the United States. The Wikipedia entry states: Neurodiversity is an idea which asserts that atypical (neurodivergent) neurological development is a normal human difference that is to be recognized and respected as any other human variation (Wikipedia 2009). The original conception of the word may have been led by those with a specific aim of advocacy for autistic people (Harmon 2004), but its use has been broadened to include a range of what are also termed ‘specific learning differences’. Neurodiversity can also be taken to include AD(H)D, which is currently viewed by many professionals as a medical diagnosis (as was dyslexia in the 1960s). The use of the word is in tune with the ideological approach of this Journal, which is to be inclusive and to avoid pathologising and ‘othering’ particular individuals. In the current edition, all but one of the six articles are written by people who experience neurodiversity themselves. The edition embodies the principle, enshrined in the editorial guidelines, that reflective pieces about personal experiences will be included. We have here several authors who have not only been identified with various types of neurodiversity, but also work as academics and/or disability professionals.

As before, many of the articles contain a combination of key facts about people with different kinds of experiences, information for staff and information of use to students.

The editorial board welcomes responses from readers; we may print some in a future edition. If you would like to see book reviews in the Journal and are willing to write one, please contact us about that as well.

The Editor is Dr Nicola Martin (nmartin@lse.ac.uk).

David Pollak (pollak1000@hotmail.com)


(accessed 30 June 2009)
From the Journal Editor

I am delighted to present the second edition of the Journal of Inclusive Practice in Further and Higher Education. In keeping with the ethos of the journal, contributions, this time on the theme of neurodiversity, are presented largely by writers who have an insider perspective. All submissions have a sound theoretical basis and practical relevance to the further and higher education context. Sincere thanks to the contributors, to Dr. David Pollak for editing this edition so carefully, to the editorial board for their diligence, to the admin team and proofreaders, and for the generous support of our sponsors Microlink who are responsible for the printing.

In response to reader feedback we are using pastel paper and a more accessible layout.

Nicola Martin
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Evaluation of a 'Super Reading' Course with Dyslexic Adults

Ross Cooper, London South Bank University
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ABSTRACT

The aim of this study was to gauge whether the impact of a reading course for adult dyslexic readers (n=15) at undergraduate and postgraduate level was sufficiently robust to justify more extensive research and experimentation. While recognising the limitations of this pilot research and the methodological difficulties of measuring 'comprehension' gains, the 'Reading Effectiveness' (RE) of the group appeared to double in ten weeks. A t-test provided a very high statistical significance (p<0.0001). There was also a statistically significant negative correlation between pre-course Test of Word Reading Effectiveness (TOWRE) non-word test scores (0.767) and the percentage improvement in RE. Given that there was little correlation between progress and initial RE scores (0.044), this is surprising and worthy of further investigation in itself, since we might normally predict that those with the most phonological difficulties are likely to make the least progress, not the most. All the participants were enthusiastic about the positive impact of the course on their reading and report a range of effects such as increased stability of print, pleasure and speed of reading. We can conclude that the apparent effect, and the nature of the correlation between the effect and difficulty reading non-words, is sufficient to justify further research and experimentation.

1. INTRODUCTION

1.1 Background

This research trial arose in a specific context. Ron Cole (2009) approached LLU+ (formerly the Language and Literacy Unit) based at London South Bank University after teaching his 'Super Reading' course for fifteen years with the observation that dyslexic readers appeared to make the most progress. I was particularly interested in his unusual approach to teaching reading improvement, because it was based on an eye exercise. The 'eye-hop' practice involves separating text into two columns. The eye hops between them taking in the meaning of groups of words in one go. The columns begin with two words each, progressing gradually up to 5 as the reader learns to take in a broader span of words at once. The specific purpose of the trial was to gauge whether there was a measurable impact on dyslexic readers that would justify further investigation, investment and collaboration.

This led to a set of research questions:

1. How can we measure improvements in comprehension as well as speed?
2. To what extent might a visual approach to reading overcome phonological difficulties?
3. How might readers with visual processing and tracking difficulties experience a visual approach to reading?
4. To what extent are existing tools to measure reading inappropriate?
5. Might the focus on what is easy to measure have misled researchers away from what is important about the nature of reading?

Of all these questions, the most methodologically difficult is how to measure improvements in comprehension when we know that a great many factors are involved (Ellis, 1993), including:

1. interest
2. prior knowledge
3. level of tiredness, or stress
4. vocabulary
5. difficulty of the text
6. motivation
7. language development
8. working memory
9. decoding skill
10. speed of reading
11. reading styles & strategies
12. culture background and knowledge of schema & genre
13. colour of paper and text
14. fonts

Since all the participants were undergraduates, or postgraduates, the texts used to measure comprehension were at an advanced level and there was no differentiation for any difficulties with reading or visual stress. Since four of the participants were below 16th percentile for all four standardised measures of reading prior to the course (The Wide Ranging Achievement Test 4 [WRAT4] single word and comprehension and TOWRE single words) and only two were above the 16th percentile for all four measures, this seemed a very challenging assumption.

1.2 Predictions

We made the following predictions:

1. Reading effectiveness would double if the participants practiced ‘eye-hops’ for half an hour a day.
2. The WRAT4 single word reading and TOWRE non-word reading scores are likely to remain static over the same time period
3. WRAT4 comprehension scores are likely to rise, but as these are untimed sentence level cloze tests, the rise may be minimal
4. The time taken to do reading tests is likely to fall.
5. TOWRE sight recognition scores may improve due to increased speed of visual recognition.

These predictions are predicated on the contention that existing standardised tests are poor measures of real reading (Hansen et al, 1998); that this trial is likely to highlight the inadequacies of the assessment tools as much as the impact of the course.
I had hypothesised that those with poor reading skills (four of whom were also bilingual learners) would be unlikely to make as much progress as those with more advanced reading skills (and the advantage of English being their first language). This view was not shared by Ron Cole.

2. METHODOLOGY

2.1 Subjects

Fifteen participants completed the course. The participants fell into two distinct groups which we have termed ‘compensating’ and ‘non-compensating’. For the purposes of this project, we defined those who were ‘compensating’ for their dyslexia by pre-course standardised scores on the WRAT4 lying within an ‘average range’ (even for the range of scores representing a 95% confidence interval). In other words, despite their dyslexia, their WRAT4 reading scores are all comfortably in the ‘average’ range. In comparison, the non-compensating group have one, or in most cases both, WRAT4 scores below the ‘average’ range.

<table>
<thead>
<tr>
<th>Mean pre-course WRAT4 scores</th>
<th>Reading</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>108</td>
<td>109</td>
</tr>
<tr>
<td>non-compensating</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>all participants</td>
<td>96.5</td>
<td>98.6</td>
</tr>
</tbody>
</table>

Eight of the participants fell into the ‘compensating’ category (although six of them achieved scores on the TOWRE below the 16th percentile). Seven participants can be categorised as the ‘non-compensating’ group. Four of the ‘non-compensating’ group were also bilingual. They scored consistently lower than other participants on the WRAT4 tests (but some in the ‘non-compensating’ group scored lower on the TOWRE).

2.2 The ‘Super Reading’ course

The course was taught entirely by Ron Cole over six three-hour sessions. The sessions were held once every two weeks. Participants were taught a range of skills and practices, including how to practice ‘eye-hops’, how previewing and reviewing reading was beneficial, the importance of using their finger to track text and a memory technique. The sessions were intended to be motivational and enjoyable which may have produced a ‘Hawthorne’ effect (Miles 2007). Comprehension was always prioritised over speed. The instruction, ‘read this as fast as you can while fully understanding it’, was therefore an instruction often repeated.

Participants were asked to agree to practice the eye-hop exercises for a minimum of half an hour a day. In the post course interviews, it became clear that very few participants managed this. We averaged around 15 minutes a day.

Within each session, participants tested their reading with prepared texts and comprehension questions. ‘Reading Effectiveness’ (RE) was calculated by
multiplying the words per minute by the percentage of correct answers given to
the questions. The methodological implications are discussed below.

2.3 Reading Effectiveness (RE) testing process during the course

The testing process during the course was as follows:

1. Participants were asked to read the test texts as quickly as they could, while
fully comprehending them.
2. At an agreed moment, test texts were turned face side up, but not yet looked
at.
3. At a further agreed moment, participants began to read their text as a large
digital clock began timing on the smart board.
4. As soon as they had finished reading, participants turned over their texts (for an
unseen comprehension test) and recorded the time taken to read it.
5. They then turned over the questions and answered them as fully as they could,
before turning the questions back over.
6. Once everyone had completed this, at an agreed moment, the process started
again, the texts were reviewed, a second time taken was recorded and a second
comprehension score recorded.
7. Participants were then helped to calculate their words per minute and RE for
‘first’ and ‘review’ reading.

All test texts were exactly 400 words long. They included large numbers of
numerical and other details that were often included in the questions to reduce
the influence of prior knowledge. During the process, Ron Cole watched carefully
for anyone forgetting to check the time, so that timing errors could be reduced.
From session two, participants were invited to preview the text for up to the first
30 seconds of reading time during the first read through. This time is included in
all calculations of words per minute. For the purposes of the research, all
calculations of RE were checked.

All test texts were randomised during the length of the course so that intrinsic
difficulties of particular texts, or the questions, could not play a role in the
apparent development of RE progress.

3. Evaluation methodology

3.1 Pre & post tests

All participants were given a range of reading tests before and after the course.
Standardised tests were chosen that could be administered twice to check on
‘progress’: WRAT4 Reading & Comprehension, TOWRE Sight and Non-words. These
tests are not without limitations and methodological difficulties. All have been
standardised on USA populations, which makes it difficult to interpret the results
meaningfully. The TOWRE has only been standardised up to the age of 25 and the
average age of the participants on the course was 41. This means that the scores
must be treated with caution, although the primary purpose of using these tests
was to look at comparative results, rather than absolute results.
Another methodological problem is that these tests are not good tests of reading, particularly the single word tests, since reading words in combination is very different from single word reading (Ellis, 1993, Tadlock & Stone, 2005).

The time taken to administer the WRAT4 was recorded, because we had predicted that the time taken would change from pre to post course. It was explained to participants that the WRAT4 was 'not a timed test, but I am going to time it to gather more information'. Since the TOWRE is timed, it was hypothesised that the TOWRE sight word scores would rise to reflect the additional speed. Since reading in context provides a range of semantic and syntactical cues to support word recognition, the increased understanding predicted when reading was not necessarily expected to improve single word recognition.

The WRAT4 comprehension test is clearly intended as a reading comprehension test. However, it has a number of flaws. Comprehension is limited to sentence level, rather than discourse. More importantly, it presents 'word finding' problems (Wolf & Bowers, 2000) that often overshadow comprehension. Most of the participants reported that the main difficulty was finding the right word to fit the space. For the four bilingual learners and one of the non-bilingual learners, finding grammatically acceptable words was also reported as a major problem.

Using a similar test twice can be methodologically problematic for two distinct reasons. The first is that the testee has a better understanding of the nature of the test, and has practiced whatever skill is required. The second is more relevant to children than adults, since we can expect a child to have made progress in their reading skills without any additional intervention in the intervening time. This temporal effect can also apply to bilingual learners, although in this case, all 4 bilingual learners had been learning English for a minimum of 7 years, so a 10 week period is unlikely to account for any change. The WRAT4 manual claims that test re-test scores can be expected to rise by 2 standardised points.

3.2 Action research

An important aspect of the research methodology was to explore the subjective experience of the participants on the course, including my own as a dyslexic reader. Participants' experience was gathered from 3 sources.

1. Informally through discussing the experience of the course and tests with participants, including two dyslexic colleagues among them.
2. From the second session, each Super Reading class began with question and answer sessions. Relevant comments were collected.
3. All participants were interviewed at the end of the course. The brief questionnaire can be found as Appendix 1.

These provided a range of insights that promoted a better understanding and interpretation of the experience and of the test scores.

Gathering these perceptions runs the risk of influencing my interpretation of data, but this risk was considered small in an exploratory trial intended to understand the experience of learners, as much as measure their progress. Care also had to be
taken that no tests were used with which any participant was familiar. Since the WRAT4 was a relatively new test, none of the participants were familiar with the content except me, having begun to use WRAT4 (and TOWRE) with learners. My own test scores on these tests were excluded from the data. None of the other participants had any experience of the TOWRE. One other participant was familiar with using WRAT3 with learners. Some of the participants thought that they might have used the WRAT3 as part of their own assessment.

4. Reading effectiveness (RE): results and discussion

4.1 Test score increases

RE, as measured, increased dramatically over the 10 weeks. All participants benefited, from a 22% to a 408% increase. On average, RE increased by 110%. It could be hypothesised that test practice alone could improve the RE scores. However, this was not supported by the experience of the participants.

"Using my finger helped me read for longer, to be in control and not get confused in the middle of the page."

4.2 Comparing speed and comprehension of ‘compensating’ with ‘non-compensating’ scores

Comparisons remain tentative, because the group sizes are small (n=8+7=15). It should, therefore, be stressed that this comparison is for descriptive purposes, since the differences do not always achieve statistical significance (see below). Nevertheless, in this trial the ‘non-compensating’ group made more progress in RE (expressed as a percentage) than the ‘compensating’ group (140% compared to 80%). This cannot be explained by a ‘regression to the mean’, because there is little correlation between improvement and initial RE scores (0.044).

Interestingly, in the first session, reading speeds changed very little for both groups between the first reading of the test text and the review reading:

<table>
<thead>
<tr>
<th>First session: wpm (1st read)</th>
<th>Comprehension</th>
<th>wpm on review</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>215 51%</td>
<td>215 76%</td>
<td>(p=0.054)</td>
</tr>
<tr>
<td>non-compensating</td>
<td>108 41%</td>
<td>110 66%</td>
<td>(p=0.052)</td>
</tr>
<tr>
<td>all participants</td>
<td>165 46%</td>
<td>166 71%</td>
<td>(p=0.001)</td>
</tr>
</tbody>
</table>

Whereas the speed changed dramatically during the test in the final session:

<table>
<thead>
<tr>
<th>Last session: wpm(1st read)</th>
<th>Comprehension</th>
<th>wpm on review</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>228 79%</td>
<td>580 94%</td>
<td>(p&lt;0.01)</td>
</tr>
<tr>
<td>non-compensating</td>
<td>179 64%</td>
<td>241 87%</td>
<td>(p&lt;0.05)</td>
</tr>
<tr>
<td>all participants</td>
<td>205 61%</td>
<td>422 91%</td>
<td>(p&lt;0.001)</td>
</tr>
</tbody>
</table>

We can also see that comprehension scores rose significantly at both stages. By the end of the course, the ‘non-compensating’ group’s comprehension at the first read through exceeded the scores achieved by the ‘compensating’ group at the beginning of the course by 13% (or 25% more questions answered correctly).
4.2.1 Statistical significance of speed and comprehension gains.

For each of the differences between pre- and post-test mean scores reported here for all participants, the statistical significance of the difference was tested using a paired t-test. Despite having a small sample, statistical significance was high for the increased ‘comprehension’ (p<0.001) at first read through, and at review (p<0.001), and for the increased speed of review (p<0.001).

At the end of the course, the ‘non-compensating’ group are reading a mean of an additional 71 words per minute at the first read stage and able to answer 53% more questions, compared to the beginning of the course. Overall, the group is reading at a mean of an additional 40 words per minute and answering 33% more questions correctly. At the review stage, participants are reading a mean of an additional 256 words per minute (more than doubling their reading speed) and answering 28% more of the comprehension questions correctly.

4.3. Comparing ‘Combined’ RE scores

Although RE scores can be calculated for both the first read through and the review reading stages of the test, for the purpose of comparison, a ‘combined RE’ score was calculated. This is because most readers slow their reading speed to comprehend and remember more, and consequently the second read through can become faster (and vice versa). In other words, for any individual, the RE scores from the first read through and the review are not independent variables. Combining them, therefore, provides a better measure of progress. This was done by adding both reading times together, calculating a ‘combined wpm’, and multiplying by the final comprehension percentage.

<table>
<thead>
<tr>
<th></th>
<th>Combined RE, session 1</th>
<th>Combined RE, session 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>80</td>
<td>153 (p=0.011)</td>
</tr>
<tr>
<td>non-compensating</td>
<td>36</td>
<td>86  (p=0.017)</td>
</tr>
<tr>
<td>all participants</td>
<td>59</td>
<td>118 (p=0.0001)</td>
</tr>
</tbody>
</table>

4.3.1 Statistical significance of combined RE scores

The overall improvement from session1 to session 6 is extremely significant (p<0.0001). By the end of the course, the ‘non-compensating’ group have exceeded the original combined RE score of the ‘compensating’ group.

There is also a statistically significant (p<0.01) negative correlation between TOWRE non-word scores and the percentage progress made (- 0.767), meaning the greater the difficulty with reading non-words, the greater the percentage gains in ‘reading effectiveness’. This cannot be explained as a ‘regression to the mean’, since there is a much weaker correlation between non-word scores and initial RE scores (0.45) and little correlation between RE Gains and initial RE scores (0.044). Following the course, the correlation between non-word scores and RE scores is reduced to 0.03, suggesting that those readers with difficulties with reading non-words have made particular progress.
There is less correlation between progress made and TOWRE sight word scores (-0.308) than non-word scores.

4.4 Discussion

Since the calculation of 'reading effectiveness' is dependent on both speed and the percentage of correct answers given to the questions, RE inevitably includes arbitrary elements. How might a reader have answered a different set of questions? How might their comprehension be affected by their interest in the subject matter, their prior knowledge, their vocabulary? These are difficult questions to address and are best handled by a larger sample than available in this trial. The scale of the apparent gains, their statistical significance and the subjective experience of increased reading speeds with comprehension, are, however, difficult to ignore.

It was also surprising to validate Ron Cole's assertion that readers with the lowest reading scores on all measures at the beginning of the course, made better than average progress. For example, the four bilingual readers improved their RE by 122%.

As already argued, reading text involves much more than phonological decoding. The correlation of RE improvement with difficulties reading the TOWRE non-words is particularly interesting and appears to support the view that readers with phonological decoding difficulties will make better progress by building on their strengths, rather than trying to remediate their weaknesses (Butterworth, 2002). It also suggests that, contrary to the 'simple view' of reading championed by Prof Rose (2006), visual recognition and contextual cues, promoted by a more rapid reading speed, play a more important role for adults than appears to have been recognised.

5. Pre & Post Standardised Test Score Results and Discussion

5.1 WRAT4 Single reading.

As predicted, the standardised scores changed very little.

<table>
<thead>
<tr>
<th></th>
<th>Pre-course test</th>
<th>Post course re-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>107.7</td>
<td>116.4</td>
</tr>
<tr>
<td>non-compensating</td>
<td>83.6</td>
<td>78.3</td>
</tr>
<tr>
<td>all participants</td>
<td>96.5</td>
<td>98.6</td>
</tr>
</tbody>
</table>

Dealing with such small numbers can be misleading. The combined results of all participants show a mean rise of 2.1 in standardised score, which is consistent with test/re-test expectations.

5.1.1 Outlying results
Individual test/re-test scores, in the main, stayed within the 95% confidence interval range between pre and post course tests.

Two of the 'compensating' group achieved test scores higher than the 95% confidence interval on the post course test (123 to 131, and 104 to 116). Both of these individuals maintained that they experienced better print stability following the 'eye-hop' exercises.

"I experience less visual stress."

One of the 'non-compensating' group achieved a score below the 95% confidence interval (87 to 76), but this score was achieved in 20% of the time taken for the pre-course test.

5.1.2 Discussion

The comparison between pre and post course test scores is interesting for two reasons:

1. As predicted, the scores changed very little. This appears to confirm that untimed single word reading test scores provide little meaningful correspondence with real reading skills, (Tadlock & Stone 2005).

2. The 'compensating' group achieved their higher mean test result (+0.58 SD) in 82% of the time of the pre-course test. The 'non-compensating' group achieved their lower mean test result (-0.35 SD) in just 33% of the time of the pre-course test. This appears to indicate that real improvement in tracking and visual recognition has resulted from the intervention. It could be argued that a saving of 67% time is a particularly valuable gain in itself for the 'non-compensating' group.

5.2 WRAT4 Reading Comprehension

These scores remained stable over the 10 weeks.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-course test</th>
<th>Post course re-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>109.1</td>
<td>106.1</td>
</tr>
<tr>
<td>non-compensating</td>
<td>84</td>
<td>84.4</td>
</tr>
<tr>
<td>all participants</td>
<td>96.6</td>
<td>95.3</td>
</tr>
</tbody>
</table>

Overall, the mean standardised score changed from 96.6 to 95.3

5.2.1 Outlying results

One of the 'compensating' group achieved a retest score below the 95% confidence interval (128 to 117). However, this was achieved in 41% of the time taken for the first test.

One of 'non-compensating' group scored above the 95% confidence interval on the re- test (68 to 78). This was achieved in 73% of the time of the pre-course test.
5.2.2 Discussion

Since this is intended as a test of comprehension, we might have expected these test scores to rise. Consequently, this result appears to undermine the claim of the course to improve comprehension. However, the WRAT4 test scores are affected by both word retrieval difficulties and grammatical expression. Participants often expressed that they understood what they were reading, but could not think of the right word to fit in the gap.

"I knew the answer, I just couldn’t think of the right word - it’s frustrating!"

This test is also a test of comprehension at single sentence level. This means that the context is restricted, unlike a page of text, which provides extended cues for expectations and meaning.

Overall, the test scores were therefore relatively stable, despite increased speed. The mean percentage time taken to achieve similar test scores was 64% of that taken on the first test. The reduced time in which the scores were achieved has a statistical significance of p<0.05.

5.3 TOWRE tests

As the TOWRE subtests are sensitive to reading speed, we expected the sight word scores to increase, but not the non-word scores.

5.3.1 TOWRE sight word test scores

<table>
<thead>
<tr>
<th></th>
<th>Pre-course test</th>
<th>Post course re-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>90.2</td>
<td>97.2</td>
</tr>
<tr>
<td>non-compensating</td>
<td>69.5</td>
<td>75.5</td>
</tr>
<tr>
<td>all participants</td>
<td>79.8</td>
<td>86.3 (p&lt;0.001)</td>
</tr>
</tbody>
</table>

It is important to remember that almost all the participants were above the ceiling age for the TOWRE standardisation. The scores cannot, therefore, be used as more than a comparative indicator of change for individuals over time. However, as we had predicted, scores on the TOWRE sight words increased. This appeared to be for two reasons:

1. More words were read in the 45 seconds
2. Less visual misrecognition occurred.

This appears to support the subjective views expressed that the ‘eye-hop’ exercises had improved print stability.

"I was surprised to find that I can now read music, where before I got lost. I can take in larger passages of music at once and recognise note positions more easily and accurately."

Increasing the TOWRE sight recognition scores by almost half a standard deviation in just ten weeks can be considered to be a significant improvement.
5.3.2 TOWRE non-word

<table>
<thead>
<tr>
<th></th>
<th>Pre-course test</th>
<th>Post course re-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>compensating</td>
<td>90.9</td>
<td>95.9</td>
</tr>
<tr>
<td>non-compensating</td>
<td>71</td>
<td>73.7</td>
</tr>
<tr>
<td>all participants</td>
<td>81.6</td>
<td>85.5 (p&lt;0.02)</td>
</tr>
</tbody>
</table>

We had predicted that non-word reading would not improve, since there has been no phonics of any kind as part of this course. Indeed, readers were gradually encouraged to abandon sub-vocalisation until reading for meaning required no phonetic attack or repair. It was, therefore, a little surprising to discover that these results rose by 0.26 of a standard deviation. The explanation for this probably resides in the improved tracking and stability of print. Some researchers argue that improvements in reading enhance phonological awareness (Morais et al, 1987). I would suggest that this is unlikely in this context - just 10 weeks and the reduction of sub-vocalisation encouraged. However, before non-words can be decoded, they must first be visually tracked accurately. Consequently, any performance on a non-word test must include some measure of visual processing of text. I would suggest that the increased scores are most likely to be explained by improved speed and accuracy of tracking and stability of print, rather than any improvement in phonological awareness.

6. Evaluation

6.1 Limitations

This research project was designed to identify whether there was an effect that needed further investigation. As there was no control group and the sample is relatively small (n=15), results need to be treated with caution.

The trial was successful in confirming that there is a sizeable and highly statistically significant effect that needs further investigation. With this small sample, the impact appears consistent and dramatic. The apparent RE of the participants has doubled in 10 weeks and all the participants report dramatic improvement in both their speed of reading and the stability of print where this was a prior difficulty.

"I noticed that print seem more stable when eye-hopping. Hallowing continued, but text doesn’t seem to have a life of its own. I feel I am looking at text rather than trying to see it."

"It allows you to motor through the reading.

One of the most exciting indications is that, despite no differentiation of reading material or tests, those with the most reading difficulty made the most progress (measured as a percentage gain), although could be partially explained by regression to the mean. But even more interesting is the negative correlation between RE progress and pre-course TOWRE non-word scores. This would appear to indicate that the reading course enabled RE to improve most dramatically for
readers with phonological difficulties without addressing phonological difficulties at all. Since there was little correlation between initial RE scores and difficulties with reading non-words, this would be difficult to explain by regression to the mean.

It was stated at the beginning that a significant methodological problem is that we do not have fit- for-purpose tools for measuring reading comprehension. Indeed, reading comprehension is such a complex process that good tools are very difficult to design. In this methodological vacuum, we used a range of available tools and designed our own measures of 'comprehension'.

The project has provided further evidence to challenge the appropriateness of existing single word tests to measure reading skills. They may predict reading difficulty, but they do not necessarily provide clear indications of how to improve reading skills (Torgesen, et al, 2001). However, it must be acknowledged that our own measures of reading 'comprehension' were flawed.

We had recognised that using multiple choice questions to measure comprehension can lead to false positives, due to factors such as the ability to eliminate unlikely answers, taking risks and sheer chance. We attempted to avoid these by asking highly specific questions that could not be known without detailed reading of the texts, and that were very demanding of the reader. The problem with these is that they also tested detailed short term memory. This demand slowed the participants reading, because we had to dwell on details, which most readers would normally 'look up' if they needed them.

The experience of being 'slowed down to memorise detail' was a common one. I would, therefore, suggest that the RE increases are artificially low as a measure of the benefit of the course. For example, my own reading speed with 'good' comprehension has risen from around 250wpm to 850wpm. This makes reading texts or marking assignments much faster. This speed is similar to the 'review speed' on my last test (857wpm). Discussions with participants, and referring to the loosely measured speeds with which they read novels towards the end of the course, appears to confirm that this is more representative of our new reading with comprehension speeds. The mean final review speed of the group was 580wpm (but ranged between 100wpm to 1500wpm). The mean review reading speed for the non-compensated dyslexic group at the end of the course was 241wpm (this is 26wpm faster than the review speed of the 'compensating' group at the start of the course, with 14% more questions answered).

6.2 Qualitative perceptions

The action research element of the research project provides additional evidence that the reading course was beneficial, since everyone interviewed after the course confirmed that they had experienced direct benefits from the 'eye-hop' exercises and intended to carry on with them.

"This was totally different. I'm now reading more. I used to see it as a problem/frustrating/annoying/waste of time. Now I feel I want to read.”
“I’m now eye-hopping when I read. I’ve got the confidence back to read again. I’ve got a feeling of being involved with words, writing, expressing myself. Confidence is worth a lot more than reading. But I am reading more quickly and more precisely.”

There were 3 participants who experienced particular tracking difficulties at the beginning of the course. Two of these were colleagues who remained unconvinced by the course for the first few sessions.

“I thought it was rubbish for a couple of weeks. Now I plan to carry on with the eye-hop. I’m definitely a quicker reader.”

They relied heavily on phonetic decoding and sub-vocalisation. Both considered themselves good readers prior to the course. They all found that the use of the finger during ‘eye-hops’ was distracting. They found the gradual move from sub-vocalisation to visual reading was a difficult process for them.

In contrast, others on the course described the process very positively. For example one participant said,

‘When I started doing the ‘eye-hops’ it felt like changing from walking (where I said every word) to beginning to run, where I only said the words when my ‘feet’ came down. They always seemed to be the important words, I don’t know how that happened. As I got faster and faster I ended up ‘flying’ where my feet didn’t touch the ground at all!’

In contrast, the three ‘sub-vocalisers’ resisted the experience and made little progress from session to session. However, on the 4th or 5th session, they suddenly found that they were able to comprehend text without full sub-vocalisation and they then made dramatic progress. All of them changed their opinion of the course and expressed the intention to continue with the visual approach,

‘since I feel that I’ve only just started to get the benefit.’
“I have definitely speeded up- my girlfriend has noticed.”

Until this ‘break through’, I had begun to believe that the course suited those dyslexic readers, who had phonological difficulties, by building on visual strengths, rather than those who had visual processing difficulties. But this sudden breakthrough appears to indicate that it is merely a matter of time; that skilled reading is essentially a visual process and requires visual tools.

A possible hypothesis that progress on the course was simply depressed by visual processing difficulties giving rise to an artefact of a negative correlation with TOWRE non-word scores is inconsistent with the evidence. Progress also correlates negatively with the TOWRE sight word scores (meaning that the lower the sight word scores, the greater the progress), but the correlation (-0.308) is weak compared with the negative correlation with the TOWRE non-word scores (-0.767),
and, as we might therefore expect, weaker than the negative correlation with the TOWRE combined scores (-0.545).

Participants described the experience of increased print stability and improved reading. One described reading a whole book for the first time. Many stated how their pleasure in reading has increased:

"I used to read more slowly than my girlfriend, but now I’m waiting for her to finish!"

"I am more versatile in how I read."

"It feels like I can choose a speed option."

I also find that I am taking much less time to assess dissertations. I read three times more books on my summer holidays than I ever have before.

7. CONCLUSIONS

7.1 Evaluation

The trial provides very good evidence of a dramatic and a highly statistically significant effect that has improved the RE and pleasure of all the participants:

"It’s a very pleasant experience!"

"I used to focus on decoding, now I’m reading more, and more quickly and absorbing the information. I haven’t got a mental block about reading."

"Reading has really improved. I’m more interested in reading. I love to read something. Reading was boring before; I couldn’t pick up a book."

"I don’t think of myself as a poor reader anymore. I’m better and faster."

It remains to be seen precisely what causes the effect. There were a number of factors involved. The teacher’s charisma and ability to engage and motivate the participants is one factor, although it is difficult to imagine that simply motivating the participants could have such a dramatic impact, when reading difficulties have been a lifelong and intransigent difficulty for many of the participants. Nevertheless, it will be important to discover whether the effect is transferable; that the effect is a product of strategy rather than charismatic teaching.

"Ron is charismatic and didn’t put people down"

The most obvious critical explanation for the effect is a flaw in the measuring methodology. This would argue that the effect was caused by variable comprehension test validity and participants learning how to do the tests more effectively, rather than the test results measuring any real change in skill. There is some evidence that might support this view. Learners learned how to preview more effectively and began to read more strategically, particularly once they
realised how detailed the 'comprehension' question were. However, there is also considerable evidence to the contrary, including:

1. The reading tests were randomised.
2. Learning good test strategies alone would be difficult to account for the gains.

Let us take one example. Just one of the participants realised that she found reading far more efficient, if she knew what the questions were first. She therefore changed strategies to read through quickly the first time, find out what the questions were, and then take more care to read through the 'review' knowing what she was looking for. On the surface, this looks like good evidence that strategy can account for much of her improvement. However, the time taken to review the last test (when she achieved 90% 'comprehension') was just 80 seconds. This compares with over 5 minutes to achieve 90% comprehension in the first test. In addition, although she only skim read the text in 48 seconds during the last test, she achieved a 40% comprehension, compared with almost 6 minutes in the first test when she scored a 50% comprehension.

"It's easy! I'm concentrating more and understanding more."

Learning to preview and ask questions of the text are generally considered good reading-for-meaning skills. So the strategies that might account for some of the improvement are part and parcel of good transferable reading strategies. Therefore, rather than be discounted as alternative explanations for reading improvement, they could be considered a legitimate part of the improved skills being evidenced.

"It's given me strategies for the rest of my life."

"Lots of useful tips- previewing, pointing, key words- made reading much easier to get into."

In addition to this, improvements in the RE scores are also reflected in the improved TOWRE scores and the increased speed with which WRAT4 scores were achieved.

Teaching preview skills is an important metacognitive strategy. What the course was very effective in demonstrating is that readers succeeded in answering more questions in less time when they used the first 30 seconds of reading time to preview the text than when they did not. Although I teach the technique, I did not use it myself if I thought that time was of the essence. I have now learned that failing to do so is a false economy.

While many dyslexic readers can appear to overcome their reading difficulties, the progress made during this course in 10 weeks is, in my experience, unprecedented. This may be partly because very little research has been undertaken to evaluate reading comprehension, recognising that it is methodologically problematic. Yet improving RE must lie at the heart of any reading intervention.
"I seem to be able to read faster and retain more of it."

7.2 Implications for disability practitioners

This pilot research suggests that reading strategies for adult dyslexic readers that focus on holistic, metacognitive approaches to reading comprehension and visual approaches to processing text are likely to be more effective, more quickly, than strategies that focus on single word decoding. This approach is not dissimilar to learner centred approaches that many dyslexia support tutors already take in further and higher education (Hunter-Carsch & Herrington, 2001), although it involves new highly effective tools and skills. However, this holistic approach contrasts sharply with what is now advocated in the school sector (Rose 2006).

I would also suggest, if my own experience can be generalised, that metacognitive strategies remain undervalued by many disability practitioners. Effective previewing has, for example, proved to enable faster and better comprehension despite the apparent additional time needed to do it. It supports the view that reading is a complex holistic process, rather than simply a bottom-up one.

Some practitioners (since February 2009) have chosen to run Super Reading courses in their own colleges, licensed and supported by Ron Cole through LLU+. I would argue that paying for the intervention through the DSA would be cost-effective, since it could be very effective in preparing dyslexic students for university, reducing the overall need for learning support.

7.3 Next steps

Research funds are now needed to extend the pilot project. This trial has provided very good evidence of an effect; we now need to establish with more certainty precisely what has created it and to what extent it is transferable. This can only be done with further trials involving a larger sample and control group. The participants on the course seem in little doubt that it is the ‘eye-hop’ exercises that made the difference, but there were other factors at play on the course. For example, the next phase of the research would benefit from reducing the memorisation necessary to achieve ‘comprehension’ scores.

We can expect that the course would be particularly effective for any dyslexic learners progressing to higher level courses that put more pressure on reading skills. This tends to occur quite suddenly as learners progress to A Levels, but in particular when they progress to university. We are very interested in trialling the intervention with students just prior to progressing to university.

"It's has a great impact. I'm understanding what I'm reading - I can grasp the concept of the story. I have a much better understanding. You should run the course next year before students start their courses!"

Indeed all the students expressed the view that they wished they had been able to take this course before they started their university courses rather than during them (and particularly not during their preparations for exams).

"The course is good, but the time's not right."

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In order to develop the framework for further research, and to begin to test out these issues, we have been trained at LLU+ to teach the Super Reading course. This has given us the capacity needed for more extensive research and allows us to evaluate the transferability of the course.

Appendix 1

Post-course participant questionnaire

1. What did you think of the course?
2. How much time do you think you actually spent doing the eye-hop exercise?
3. How did you find doing the eye-hops?
4. Do you think that doing the course has made a difference to your reading?
5. Is there anything else you noticed that you would like to tell me about?

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Dyscalculia in post-16 education

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Abstract

It is well known that Mathematics is a difficult subject for many, requiring an ability to reason, manipulate abstract symbols and conceptualise symbolic elements. It is compulsory within 11-16 education and, sadly, frequently taught as a boring set of dry, dusty, algorithmic techniques with little relevance to the outside world. Many FE and HE students are devastated to find they are still required to study the subject and are bemused and worried when told it is a necessary, integrated component of their chosen field of specialisation. Dyslexia and dyspraxia can impact adversely upon a student’s ability to memorise techniques, copy accurately from line-to-line, select relevant information, read graphs and communicate mathematically on the page. Yet Maths can be exciting, creative and stimulating; with good support, many neurodiverse students reveal hidden talents and become brilliant mathematical communicators. Dyscalculia is defined in many different ways. This reflects confusion between Maths and numeracy; confusion between conceptual understanding and ability to manipulate symbols on the page; confusion between memorising by rote and the ability to reason and justify. In this article, I attempt to clarify this issue, offer a working definition of dyscalculia as innate ‘number-blindness’ and separate this from the mathematical problems caused by dyslexia and a range of other important factors. The paper reflects on my close working experience with a diverse group of individuals over many years, from wide-ranging backgrounds and with various abilities, interests and thinking styles. It converges on the experiences of one group in particular, who are often misjudged: highly intelligent, articulate and abstract thinkers, who nevertheless experience frustration and unexpected difficulty in conceptualising simple symbolic numerical elements, such as fractions or directed numbers. These dyscalculic thinkers have much to offer support tutors; increased understanding of dyscalculia and how to develop productive teaching will only follow from giving them a platform.

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Dyscalculia is a relatively new addition to the neurodiversity stable; a clear, consistent definition remains problematic and controversial. Much of the research concerns young children and the difficulties some have in developing basic numerical skills. Analysis of the problems experienced by post-16 students in this area is relatively neglected; yet mathematical or statistical competence is a necessity for many tertiary-level fields of study. Maths is notoriously problematic; in this article, I shall attempt to tease apart indicators of dyscalculia from general difficulty in solving mathematical problems. The latter can arise from many factors. Dyslexia and dyspraxia may also cloud mathematical understanding; I shall try to draw a distinction between these and my own definition of dyscalculia.
Finally, I hope to give a voice to a relatively small yet important group of students, who are often ignored: highly intelligent, abstract thinkers, with powerful reasoning ability, who excel in their own fields, yet show strong dyscalculic tendencies and are intensely frustrated by their self-recognised conceptual difficulty in comprehending, interpreting and manipulating simple mathematical symbols.

In general usage in the population, the term ‘dyscalculia’ is frequently regarded as a synonym for ‘difficulty with Maths’. Wiktionary (2007) defined it as its ‘word of the day’ on September 27th, 2007 as ‘Difficulty in solving mathematical problems’. As a mathematician and educator, I find this irritatingly over-simplified and distinctly unhelpful. Maths is not a static, completed project; it is a progressive, still developing, process of discovery, improvement and application. Anyone, depending on what they are trying to achieve, can have a ‘difficulty with Maths’ - including mathematicians. It is a deeply complex subject and can be frustratingly counter-intuitive; consider the intricacies of quantum mechanics. Moreover, Maths has a very bad press, and many people openly have intense difficulty with it; the impression is sometimes that it is the norm to feel this way. A sizeable number of post-16 students detest it; they do not even think it possible that anyone could like it, and consider it a gamut of ridiculous techniques and algorithms that are sold as ‘useful’, but are anything but. Media presenters are embarrassed to reveal any literary lack of knowledge, but frequently reveal - even flaunt - problems with Maths and numeracy. Even textbooks reinforce the image; one Economics textbook (which shall be nameless for obvious reasons) entitles a chapter ‘Algebra is boring’, which is surely a self-fulfilling prophecy for the algebra to follow.

In short, ‘Maths difficulty’ is commonplace and widely accepted. Yet, it causes many learners considerable stress and worry. They feel they ‘should’ be able to comprehend the material, but they do not. Some higher education (HE) students feel it will even cost them their degree. Despite competence in their own field, in Maths they feel stupid, hopeless and utterly incompetent. At first sight, this might suggest a widespread specific learning disability of some kind, yet my experience as a practitioner does not really support this. From many years of talking to students, discussing their problems and reflecting on their improvement, I would argue that the following seven factors are the most common in creating this ‘split’ between mathematical disability and contrasting academic ability in other areas. These are (1) poor, uninspired teaching; (2) the image of Maths as boring, dry, technical, uncreative, ‘nerdy’; (3) highly negative, humiliating experiences at school or from other authority figures, which have caused deep anxiety and emotional reactions to the subject; (4) weakness in spatial ability; (5) dyslexia or specific challenge to short-term memory; (6) dyspraxia or more generalised writing or drawing difficulties; (7) a brain which is brilliant at divergent thinking - creatively going off at tangents - but finds it hard to ‘stay on track’, to focus, to keep distracters at bay. Of course, very often several of these factors are present; quite possibly all of them.

There have been other popular attempts, particularly with young children, loosely to define dyscalculia as something like ‘difficulty with numerical tasks they should be capable of at that age and level’. Word Net (2006) defines it as ‘impaired ability to learn grade-appropriate mathematics’. This visualises Maths as a straight
path, with all techniques in an exact order from easy to difficult, and with 'age
signposts' along the way. I view this image as misleading; children and adults vary
widely in the kind of topic they find easy or difficult, and Maths is generally very
teacher-dependent. A weak teacher, somewhere along the way, can create major
problems. I have also met many students who find the logic and discipline of
algebra or geometry interesting and accessible, but cannot remember times tables
and hate straight arithmetical calculations. Finally, that attempt at definition does
not translate at all well into further education, especially in the case of mature
students. Many have forgotten any Maths they once knew; certainly many will have
difficulty retrieving supposedly simple arithmetical techniques learned by rote
many years before and never used since. It surely clouds the issue to label them
‘dyscalculic’ without further information at least.

In his Guardian article, journalist Tim Radford (2003) portrays dyscalculia as ‘the
arithmetical equivalent of dyslexia’. It is quite common in the media to find
references to dyscalculia as a kind of dyslexia 'mirror image'. I find this portrayal
confusing and fraught with contradictions; I offer three reasons. Firstly, and most
importantly, it obscures the very real difficulty that many dyslexic people have
with both general maths and numeracy. According to recent estimates,
(Butterworth 1999) around 10% of the general population is dyslexic and of these,
around 40% have some difficulty with Maths. It is now recognised that dyslexia is
not just a reading disability; it is considerably more complex than that. Dyslexic
people frequently have difficulty with sequencing, and focussing on one line of
thought; there are often working memory challenges. These are crucial skills for
success with Maths problems, so we would expect a sizeable proportion of dyslexic
students to have mathematical difficulty, and this proves to be the case. To label
the 40% as being ‘dyscalculic too’ is unhelpful; it is probably their dyslexia causing
the problem, and we know a great deal now about offering the best support to
these students and unveiling their underlying abilities. Many in my experience,
with one-to-one creative, individual dyslexia support, turn out to be excellent at
Mathematics.

Secondly, there is some evidence, particularly from the experiments of
psychologist Karen Wynn (Pinker 2000) for a 'number instinct' - an ability to
distinguish between , and possibly add, numbers up to 4 - even in very young
infants; this is shared also with some animals. It is not hard to see how a number
instinct might confer some 'survival value'. Pinker (op. cit.) conveys this
succinctly:

'Three bears went into the cave, two came out. Should I go in? '

An article in The Economist newspaper (2008) also describes these experiments
with newborn babies and even wild animals such as lions. It describes the discovery
of an innate 'number sense' in most humans and some other animals. Clearly, there
can be no 'reading instinct ' in infants: reading is a wholly-learned skill.

Finally, numbers are not a medium for communicating ideas in the way that letters
forming words are. They have meaning in themselves. In this sense, they are much
more like musical notes or colours: a box of two apples can be distinguished from a
box of three apples in a similar way to how a box of red apples is distinguished
from a box of green apples. Numbers, sounds and colours are 'out there' as features in the environment. We model them in our brains and label them in order consciously to classify what we perceive; 'middle C', 'green', 'two'.

The Department for Education and Science (2001) defined dyscalculia in the following way:

"Dyscalculia is a condition that affects the ability to acquire arithmetical skills. Dyscalculic learners may have difficulty understanding simple number concepts, lack an intuitive grasp of numbers, and have problems learning number facts and procedures. Even if they produce a correct answer or use a correct method, they may do so mechanically and without confidence."

There are several problems with this definition too. Many people carry out numerical techniques 'mechanically and without confidence' because, basically, they have been taught in no uncertain terms that this is how it is done. Many people also 'have problems learning number facts and procedures', because they are bored rigid by the rote learning of (to them) meaningless algorithms such as long division procedures.

'Lack an intuitive grasp of numbers', however, does seem to tap into more productive territory. Referring back to the 'number instinct': are there people who lack this, or are weak in their conception of number? It does seem convincing that there could be a form of 'number-blindness', analogous to 'colour-blindness', where the actual perception of numbers, even the simplest of them, is faulty. If the 'number instinct' revealed in Karen Wynn's work is weak or somehow not attached in the brain to the particular symbols we use in our culture, problems could arise, and this condition, if it exists, would seem to deserve the name of a new form of neurodiversity. Butterworth (1999) describes Charles, an adult who typifies this at an extreme level. Charles has a degree in psychology, yet says he is unable to estimate his shopping basket prices, can only do straight-forward sums on his fingers, and finally, most significantly in my view:

*He couldn't tell whether 9 was smaller or bigger than 5 and had to use his fingers to work it out.*

If Charles could use his fingers, he could presumably count but counting is not the way I, and probably you, can immediately tell that 9 is bigger than 5. I know this because I 'see' it in my head, on a kind of 'number spiral' in my case. Others may visualise objects or patterns - there are many possibilities. It seems conceivable that some people do not have any kind of template on which somehow quickly to match up the numbers 9 and 5, and this lack is similar to lack of colour perception, or inability to distinguish between the pitch of two musical notes. Butterworth's student Charles is an extreme example, but I have met several students who have similar difficulties to the above; numbers, even sometimes positive whole numbers, are basically meaningless labels; like telephone numbers or Sudoku numbers, they act as mere discriminators with no order or value.

Here is a quote from Beth, one of my own past students:
'Numbers are like raindrops in no particular order'

Beth was highly intelligent, creative and very much a divergent thinker. Her rather beautiful quote shows, as did working with her, that she was not exactly fearful of numbers. She recognised, quite rightly, that they have different attributes - personalities almost - but her idea that they do not have a particular order is quite remarkable; positive whole numbers most certainly do convey order. Looking back at Charles, Butterworth’s student, we also see someone for whom the order property of simple numbers is not immediately or intuitively obvious.

To summarise, there do seem to be some people who, despite above-average intelligence, have a weak instinct with positive whole numbers; the ‘twoness of two’. They somehow have not internalised that, outside of their use in telephone numbers and other unordered labelling systems, the main role in life of these little mathematical symbols is precisely to indicate value and order. This has little to do with intelligence, but seems to be similar to a kind of tone-deafness or colour-blindness. This, despite normal or high intelligence and reasoning ability, will surely have as its indicators: challenges with even very simple sums, estimation of size, everyday time and money calculations, reversals and directions. This is quite different from the difficulties some FE students - particularly adults - may have with ‘school-type maths algorithms’ but who cope easily with day-to-day, intuitive, practical numeracy. It seems useful to refer to this as ‘classic dyscalculia’.

The science editor of ‘The Independent’, Steve Connor (2008), describes Butterworth’s report on his Cuban Survey into dyscalculia to the Cheltenham Science Festival. According to Butterworth, who also defines it as ‘number-blindness’, it may affect 6-7% of the general population. However, this appears to include those with more general learning difficulties. It seems likely that the percentage of people with this extreme form of dyscalculia in HE, and to a lesser extent in FE, will be considerably lower than 6%. Nevertheless, if we extend the definition a little, we arrive at a more useful understanding, in my view. I focus now on post-16 students with normal to high ability across the rest of the academic range and without particular complaint regarding their school experiences of Maths teaching. None of the seven factors described earlier were particularly influential in their lives. The difficulties these students have revolve round ‘conceptual understanding’ of Mathematics and its symbols, not the actual carrying-out of techniques on paper. Many of these students state that they were reasonably happy with simple numerical techniques in the early years of primary education, although it was not terribly interesting, but crashed into a solid barrier, usually at secondary school, when a new concept was introduced. By far the most common of the ‘crash’ concepts they cite are: (1) fractions; (2) minus numbers; (3) first algebra (or ‘the letters’). I suggest that students in this category have a weakened, though not zero, perception of the meaning of positive whole numbers, together with simple operations; they are not in the ‘Charles’ category yet lack a ‘template’ of intuitive or visual patterning that can adjust and stretch to include the new ‘crash’ concepts. They become ‘stuck’ on what these new concepts really mean and cannot relate them to any kind of sensible picture in their mind, which will generalise what they already know. There seems to be a ‘gap’ in how their brain is operating; this I deduce both from listening to them and observing their
work. It seems to me useful to define a 'dyscalculic spectrum', which includes these students at the higher end. I suggest it would look something like this:

<table>
<thead>
<tr>
<th>Dyscalculia Spectrum</th>
<th>Difficulty with:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering &amp; comparing whole numbers under 10, judging time and direction</td>
<td>EXTREME</td>
</tr>
<tr>
<td>Everyday tasks involving simple time and money computations and judgements even with calculator</td>
<td>SERIOUS</td>
</tr>
<tr>
<td>Slightly more abstract concepts, such as area, volume, weight, and understanding of simple fractions, decimals</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Minus numbers, fractions, decimals, especially comparing these, algebraic concepts</td>
<td>MILD</td>
</tr>
</tbody>
</table>

Many of these milder dyscalculic yet intelligent students want intensely to understand. Minus numbers and fractions can seem crazily bizarre, with their new 'how to' rules and mystifying rituals such as 'turn it upside down and multiply across', '2 minuses make a plus', and so on. For some students, their intelligence and confidence in other fields turns against them, as they desperately try to analyse what is going on and cannot make sense of it. If you look at it on a certain level, there are actually surprising contradictions in maths; multiplication in primary school with positive whole numbers is a quite different process from multiplication of fractions or minus numbers, and certainly from the multiplication of matrices needed in some engineering courses in HE. Intelligent dyscalculic students are often artistic or rebellious; they won't accept such a sudden radical changing of the rules.

As Graham, a highly dyslexic, moderately dyscalculic but extremely bright logician student of mine said:

'In Maths, they are always changing the goalposts. Computing is logical, maths isn't.'

The answer to the multiplication conundrum is to realise that multiplication is a conceptual idea that is forever being extended and stretched, yet always remains the same basic notion. You cannot just inform students of this. They have to conceptualise it somehow in their heads - visualise it or link it to another intuitive idea; even a mild form of 'number blindness' can prevent this happening. It is very frustrating for many of these students - especially the very bright ones - to find ways of expressing their difficulty with it; they will not just accept new rules without meaning, and indeed why should they? Even those with good memories, who can cram to some extent, will be unable to apply it to their fields of study successfully.

Finally, I would like to focus closely on this group of students. To recapitulate: they are academically bright, enjoy abstract thinking, cope well with their own
field of study, yet feel the presence of solid barriers to progression in Maths; fairly
elementary concepts such as minus numbers, fractions, simple algebra or Cartesian
graphs do not convey information as they should. They consciously have no means
to visualise these concepts and are unwilling - or unable - to memorise rules by
rote. I have worked with several of these students over the years. They frequently
deny that using concrete, practical scenarios helps them; sometimes this approach
makes it worse. They often state that they find 'stories', coloured blocks and more
kinaesthetic approaches to teaching (undoubtedly helpful with other learners)
infuriatingly patronising. They are often bored by endless practice of basic
numeracy; they tend to be far more interested in cracking algebra or geometry.
They often love entering into dialogue with a tutor and indulging in 'tangential
thinking'. They are perhaps a smallish proportion of dyscalculic students in general
and certainly a very small proportion of those with 'Mathematical difficulty', but I
believe their self-awareness and articulation makes them ideal candidates for
encouraging greater understanding of this syndrome, and I would like to give them
a voice here.

One of these students was Graham - he of the 'goalposts' comment earlier - with
whom a case study was carried out in 2004 (Robertson). Graham was studying for a
Master's degree in signal analysis. He was highly intelligent, very dyslexic and also
showed many signs of serious to moderate dyscalculia. He first presented himself
for Maths support, claiming to have problems with fractions; this was quite true.
He had not the slightest idea what fractions represented, and diagrams of pizzas
and cakes left him cold. He would follow defined, abstract, formulaic rules for
manipulating fractions happily enough, but he considered these a rather trivial
algebraic invention; he could not relate the techniques to any sort of visual
intuition or reality. He had problems with time, sequencing, copying and working
memory; most of these difficulties were likely to be due to his dyslexia, but some
seemed to relate to the number problems as well. When allowed free rein to
discuss, he showed all the signs of being an excellent mathematician; he was
basically a convergent thinker with complete intuitive understanding of the need
for clarity, definition, accuracy and logic. He frequently criticised his lecturers on
their logical consistency; he was always right. He was also highly verbal, creative,
and loved developing new ideas in a logical way. He was quite self-aware and
explained his difficulties with fractions, minus numbers and algebraic letters quite
coherently. As I have mentioned, he thought of fractions as a daft human
invention; he had no picture in his mind. He also thought of algebraic letters as a
human invention, but he could see how to work with them. However, he expressed
many times his frustration at their logical inconsistency; the way they can
sometimes signify units, or at other times objects, or numbers, or variables, or
constants, or a measure (such as temperature) or simply words; it drove him
crazy. (If you cannot see what he meant, think of all the meanings you can in
science and Maths for the letter 'c'). My (untested as yet) hypothesis is that
dyscalculic thinkers lack some kind of link between visual images and symbols; this
would include the idea expressed earlier that extreme dyscalculics cannot visualise
simple whole numbers in an ordered pattern. The visual image allows a metaphor
of a concept, which in turns leads to generalisation: the stretching and extending
of a concept as mentioned previously with regard to multiplication. I cannot resist
at this point quoting Stephen Fry (1997: 331-335), who describes his sudden
mathematical 'coup de foudre':

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Algebra, I suddenly saw, is what Shakespeare did. It is metonym and metaphor, substitution, transferral, analogy: it is poetry. I had thought it’s a’s and b’s were nothing more than fruitless (if you’ll forgive me) apples and bananas. Suddenly, I could do simultaneous equations.

Jan Poustie (2000), someone who is dyscalculic herself and now writes on the subject, describes in her book how the revelation that multiplication could be illustrated by the area of a rectangle was a complete eye-opener and brought the whole concept to light. I have sometimes also found this image helpful with dyscalculic students and indeed others; the length and width are given equal status and the commutative law reveals itself by a quick flip of the block. The relatively abstract scenario works where supposedly practical ones fail. According to Poustie, up till that time, she was taught the multiplication concept in terms of ‘number of apples per tree’ and ‘number of apple trees’; she clearly delineates the logical inconsistencies of this in her book and expresses her confusion very clearly. She is quite right in pointing this out; it is logically inconsistent and all this rings similar to Graham’s problems to me. I suggest that dyscalculic thinkers - and this is true of some dyspraxic thinkers too, in my experience - lack a ‘bridge’ to carry them from a superficially practical idea to the mathematical notation on the page. So-called practical scenarios - often forced, like the apple trees or, in Graham’s case, the pizzas - simply do not work. They need an ‘abstract visual bridge’, like the rectangle, which can reveal all and allows them to generalise and interpret the symbols.

Another dyscalculic student of mine, who illustrated similar thinking, was Patrick, a final-year textiles/business student. He was of above-average intelligence, finishing with a 2:1 degree. I worked with him on statistics for his degree and GCSE Maths, which he was attempting for the third time. Like Graham, he was very self-aware; he knew he didn’t understand it, and was not willing to ‘waffle’. In GCSE Maths, he had real difficulty with what he saw as ‘woolly language’ and, in particular, minus numbers; he saw positive and negative whole numbers as static positions, like temperatures. Once I caught him staring hopelessly at the question ‘what is ‘-3.5’’, number line in front of him, one finger on the -3 and another on the -5. It was clear immediately from his expression what he was thinking: How can you possibly put these together? They’re just positions! ‘ Patrick needed considerable support to talk through these difficulties and devise new visual images that worked; in the case above, this involved throwing away the useless number line of temperatures and looking at minus numbers as dynamic shifts - movements up and down. This offered him the right metaphor.

In FE and HE, dyscalculic students need support to bring out their underlying capabilities. Careful tutoring from expert teachers is required, especially from those who are not afraid to (1) give the student the opportunity directly to discuss their difficulty plus Maths in general; (2) offer new visual images they can use; (3) create new ideas on the spot, always prepared to adapt to the individual needs of the student in front of them. Linking different topics together, devising ‘open’ questions, asking the student to ‘create the question given the answer’ and, above all, never denying the student an explanation is good practice for all students; it
is, however, particularly effective for those with the abstract, verbal, divergent thinking style which often seems to accompany dyscalculia.

It may well be that there are no easy answers to supporting post-16 dyscalculic students; creative, supportive adaptation to the individual is the only way forward in my view. Clearly, this requires, from the support tutor, a bank of ideas and resources to draw on; a deep understanding of Maths; the ability and confidence to reflect on why a student is not following; and finally, knowledge of the student’s background and how school maths is usually taught. This can be demanding.

More research does need to be carried out and, above all, we need, as always, to listen to the - often articulate and verbal - students; to learn from them, and understand their perceptions -their understanding - of the ‘twoness of two’. (Or, indeed, the minus-twoness of minus-two) We should also not be afraid to work on changing these perceptions if they are hindering progress. The sudden ‘a-ha!’ flash of insight from a student, who suddenly crosses a threshold into true understanding, is immensely rewarding to the tutor; it is well worth the effort.

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Dyspraxia & AD(H)D in post 16 education

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This article aims to cover a large amount, in terms of both theoretical perspectives and practical advice. It will begin with general definitions of dyspraxia and AD(H)D, the theories about these types of neurodiversity and the indicators of them in students. It will go on to provide guidance, for both general and specialist staff, on how to support dyspraxic and AD(H)D students. Finally, the article offers information for students themselves. Students will be referred to as dyspraxics and ADDers, as this kind of language is simpler and more friendly; however, it is essential to remember that we are talking about people who are primarily students. They are not defined or circumscribed by their labels, and many of their experiences may be shared by the majority.

The two types of neurodiversity have been dealt with together because in 40-50% of people they overlap. Gillberg amalgamated the two and called them DAMP - Deficit in Attention and Motor Perception (e.g.Gillberg 2003). People do not 'grow out of' their essential nature (e.g. for ADHD, Hall & Ratey 2006:8; and for dyspraxia, Cousins and Smyth, 2003; and Losse et al 1991)

There is much more research done on AD(H)D than dyspraxia, and this will be reflected in the article. It will go into some detail about the nature of both, as they are often misunderstood. Many people will not be accurately identified; frequently, students are identified as dyspraxic when they experience organisational challenges, but not motor co-ordination issues. The afore-mentioned are far more likely to have AD(H)D than dyspraxia, as poor co-ordination as a child and/or as an adult is an essential part of dyspraxia.

Definitions

Dyspraxia
Dyspraxia can be defined as ‘an impairment or immaturity of the organisation of movement. Associated with this may be problems of language, perception and thought’ (Dyspraxia Foundation 2009). It used to be called ‘clumsy child syndrome,’ motor control deficit or ‘minimal brain damage’. It is now also known as perceptuo-motor dysfunction or, more commonly, developmental co-ordination disorder (DCD).

Dyspraxia varies in form and severity. Motor coordination weaknesses may be primarily those of fine or gross motor control, or both; they are
reflected in a range of everyday experiences, including bumping into objects and people, poor balance and difficulty with everyday tasks such as housework and cooking.

Dyspraxia also typically includes weaknesses in short-term memory, visual processing and visual tracking. These neuro-cognitive weaknesses are reflected in such everyday experiences as forgetfulness, disorganisation, difficulty following instructions and/or directions and going off at tangents. In some instances ‘reading’ non-verbal face and body signs may also be a challenge. Some dyspraxics are hyper-sensitive to touch, sound or light, and many report sleep difficulties (Grant, 2009a).

For dyspraxic students, their obvious lack of physical co-ordination and manual dexterity makes them vulnerable to criticism and bullying at home, school and work. This can have a knock-on effect: the more they are criticised and bullied, the worse their emotional and behavioural issues become.

**AD(H)D**
The abbreviation AD(H)D stands for Attention Deficit (Hyperactivity) Disorder. The ‘H’ is usually placed in brackets because not everyone experiences hyperactivity. The American manual, DSMIV (American Psychiatric Association 1994) defines AD(H)D as a single condition with three sub-types:

- mainly inattentive
- mainly hyperactive/impulsive
- the combined type.

There is also a checklist in the DSMIV listing 18 factors that indicate AD(H)D. Nine factors indicate the inattentive type and nine constitute the hyperactive/impulsive type. The individual needs to experience six in one section to be considered inattentive or hyperactive/impulsive. If they score six from each section, they are considered to experience the combined type.

AD(H)D is defined by Barkley and Murphy (1998:1) as "a specific developmental disorder ... that comprises deficits in behavioural inhibition, sustained attention and resistance to distraction, and the regulation of one’s activity to the demands of a situation (hyperactivity or restlessness)". Poor behavioural inhibition and self-regulation are seen by Barkley (1997) as the central impairments in AD(H)D.

AD(H)D was first described at the beginning of the 20th century as a defect of moral control. It has also been called hyperkinesis, just ADD, and, like dyspraxia, minimal brain damage. As a neuro-biological
impairment, AD(H)D is now covered by disability legislation in the UK (DDA 1995, 2005), as is dyspraxia.

**Overlap with other types of neurodiversity**

Dyspraxia and AD(H)D overlap with many other varieties of learning difference, particularly dyslexia and Asperger's Syndrome, as shown in the diagram below. In fact, it is the norm rather than the exception to experience more than one type (Grant 2009b).

(Source: Developmental Adult Neurodiversity Association)
Executive Functions and Impaired Inhibition in Dyspraxia and AD(H)D

Both dyspraxia and AD(H)D are increasingly seen as linked to an impairment of the brain’s ‘executive functions’ or cognitive management functions (Barkley 1997). Drew (2009:99), writing about the characteristics of dyspraxia, refers to the executive functions as ‘central processes that are most intimately involved in providing organization and order to our actions and behaviour.’

Barkley (2006:316 & 321) views behavioural self-control as dependent on four executive functions: nonverbal working memory (including foresight, hindsight, sense of time and concentration); verbal working memory or internalization of speech; self-regulation of emotions and motivation; and reconstitution (being able to learn from experience). He believes these impairments lead to motor control and execution deficits, both gross and fine, for example poor handwriting. These, of course, are also the primary indicators of dyspraxia.

Impairment of these executive functions also affects a person’s ability to integrate, regulate and prioritise other cognitive functions (Grant 2009b).

A student begins to write up research project which is due to be handed in the next month, having done only a limited amount of preparation. She has collected the research data, but cannot find some important books when she needs them. She delays the report while she rushes around searching for the book. She then feels hungry and goes to get some food, after which she completely forgets that she was looking for a book. She starts writing the report without the necessary book, and soon realizes she can’t proceed without it – so she begins the search all over again. After a bit, she finds the book at the bottom of a disorganised pile, and has to start again – but by this time she is tired and stops working. The next day, she can’t find the rough plan she had made for her report, but continues nevertheless - without any planning or system – but it’s more haste less speed! A friend then pops around to see her, and she instantly stops working. She finally settles down again, after her friend has gone, and tries to re-focus her mind on her project; however, all sorts of other thoughts take over her mind, and she becomes totally obsessed with another project that she finds far more interesting, which she begins to work on for a short time. She eventually manages to bring herself back to her research project, and forces herself to write frantically for an hour or so – only to realize that she has strayed completely off the subject, and has to start yet again. She finally finds her missing plan, but can’t read her handwriting – and then manages to spill coffee over some of the notes, making them unreadable. This erratic, unregulated behavior continues day after day, until the student fails to meet her deadline and has to ask for an extension that she may not get. (adapted from ‘The Disorganised Cook’ (Denckla 1996, cited in Brown 2006:11)
Impairment of executive functions often involves impaired inhibition, particularly in the case of AD(H)D. Impaired inhibition can cause a range of difficulties including poor academic performance; poor family and social relationships; challenges in employment; anxiety and depression; and a greater likelihood of driving accidents and of alcohol and drug abuse (Barkley 1997).

**Characteristics of dyspraxia and AD(H)D**

Before going on to learning support in college or university, it is useful to take an overview of the characteristics and the types of barrier typically faced by dyspraxic and ADDer students. This may also help with the mis-identification issue referred to above.

Students who are dyspraxic and/or ADDers may have difficulty in a number of areas including:

- manual and practical work (dyspraxia only)
- personal presentation (dyspraxia only)
- spatial skills (dyspraxia only)
- hyperactivity and impulsivity (AD(H)D only)
- attention span and distractability (Both dyspraxia and AD(H)D)
- memory and organization (Both dyspraxia and AD(H)D)
- written expression (mainly dyspraxia)
- visual and oral skills (mainly dyspraxia)
- numeracy skills (mainly dyspraxia)
- difficulties with social, communication and emotional behaviour (Both dyspraxia and AD(H)D).

**Manual and practical work (dyspraxia only)**

The challenges of manual and practical work can affect dyspraxic students in numerous ways. They often struggle with using keyboards and mice. Their handwriting is usually slow and poor/ illegible and their work is often messily presented. They may be challenged by science courses, having frequent spills in the laboratory and difficulty taking accurate measurements. They are also very likely to experience challenges with craftwork and operating photocopiers. In addition, the everyday tasks that students have to cope with in university residence or digs can be overwhelming – for example, using washing machines, ironing, shopping, cooking, and using can-openers.
As soon as I arrived on campus everything started to go wrong. It was the practical things that challenged me: close to tears, I’d spend up to an hour trying to get the key in the door to my student digs. I couldn’t find my way around campus and it was a nightmare trying to work out how to use the washing machine or change the duvet on my bed. All of these simple tasks were a massive challenge, but I felt ashamed so tried to hide my problems from the other students. I couldn’t even open a bottle of wine or make someone a cup of tea as it would take me so long.

Nicky

Because of their difficulties with practical tasks, work experience can also prove hard for dyspraxic students. They might well find using new machines a challenge. On top of this, their social skills can be lacking.

**Personal presentation and spatial skills (dyspraxia only)**

Dyspraxic students may also have gross motor difficulties with their personal presentational and spatial skills that can make things difficult for them at university. They tend to be untidy and rumpled, have a clumsy gait and poor posture. They frequently bump into things and trip over. They can also be poor at sport. However, these difficulties may be less of an issue at college than they are at school or in the workplace.

**Hyperactivity (AD(H)D only)**

Restlessness and constant movement are typical behaviours for many ADDers. Students may find it almost impossible to remain still throughout a lecture, and will begin to fidget or to talk to other students or keep going out ‘to the toilet’. Some may rock in their chairs, drum their fingers, or search their bags for items. They frequently play with things e.g. making paper darts. Some may sit still – but will not follow the lecture because of a stream of thoughts whirling around in their brains. Lecturers and other students are likely to become infuriated by this behavior. Other ADDers will be very tired because they have general sleep problems.

**Impulsiveness (AD(H)D only)**

Impulsiveness is another common feature of ADDer students, who frequently interrupt other students and lecturers in the middle of seminars or lectures. It is almost as if they are speaking their thoughts aloud and cannot control their outbursts. They do not think about whether their remarks are relevant or what reaction they might get. (This issue can also arise because of fear of forgetting a good idea, which is another way in which dyspraxia can overlap with dyslexia.) ADDers often seem to have a need for immediate gratification, which can also lead to addictive behaviour such as substance abuse, over-eating or impulse buying.
They may be very impatient and need constant stimulation when they get bored – which they do frequently. As a result, they can engage in high-stimulation and high-risk situations. They tend to jump from one job, or one interest, to another. ‘They always want to take short cuts, starting in the middle of something rather than the beginning, as this can be very boring’ (Colley 2009: 174-5).

ADDers also react against following rules and procedures; they have a short fuse and can become angry easily and rebel against being told what to do, especially if the rules don’t make sense to them. They can appear very talkative and frequently go off at tangents. Young and Bramham (2007:15) believe that poor impulse control can have serious consequences, because it may result in aggressive and anti-social behaviour such as crime, harm to self and others, and driving accidents.

Inattention/distractibility (Both dyspraxia and AD(H)D)

Although ADD is usually seen as an inability to focus attention, it is perhaps more correctly seen as attention inconsistency rather than attention deficit (Hallowell and Ratey 2006:5). In fact, ADDers can also over-focus – especially if the subject interests them or strongly motivates them. They may, for example, completely forget to have a meal if they are caught up in an interesting subject (another overlap with dyslexia).

Nevertheless, AD(H)D usually occurs in the form of an attention deficit. ADDers’ minds may wander off while listening to people, they may lose track of a discussion or conversation, or they may lose track of time and forget appointments. (Some ADDers say that they can only perceive time as ‘now’ or ‘not now’.) ADD and dyspraxic students tend to lose track in long lectures, particularly on subjects that do not interest them. This may make them wish to walk out, fall asleep or day-dream. They are distracted not only by external events (particularly noises) but also by internal thoughts, which can make them appear dreamy. Because of their difficulty focusing on a specific thing, they often make what appear to be ‘careless’ mistakes in writing and reading. Their failure to sustain attention will also make proof-reading very difficult for them.

ADDers and dyspraxics can also find it difficult to multi-task – for example alternating between listening to a lecture and taking notes. They may also have trouble completing routine tasks or setting study schedules.

The distractibility of ADDers and dyspraxics can also make them very prone to procrastination. ADDers in particular may therefore find it hard to start a piece of written work. They will put off doing a task till the last possible moment. They may delay until shortly before the final deadline, when the rush of adrenaline may help them.
Memory and organization issues (dyspraxia and AD(H)D)

Attention and short-term memory challenges can lead to other difficulties, such as with planning, time management and prioritising. It is often assumed that dyspraxia is mainly a motor control issue, whereas in fact what might be summarizing as 'forming a concept of the task' is just as significant, particularly in an educational or work context. ADDers and dyspraxics can lack foresight or hindsight, thus failing to learn from experience, not recognizing the possible consequences of their actions, or forgetting to plan ahead. They forget and lose things and tend to seem rushed and unprepared. For this reason, too, are also liable to be late and miss appointments, which can be very frustrating for all concerned.

Written expression (mainly dyspraxia)

Unlike dyslexics, dyspraxic people, on the whole, are not challenged by reading, but their spelling and punctuation can be very erratic. Their sentence structure tends to be awkward and confused and, like dyslexics, they often include irrelevant material in their essays and reports. On top of this they find proof-reading very difficult, and can be slow to complete their work. Of course, many are dyslexic as well as dyspraxic. (However, there are some dyspraxics who have no problem at all with written work, such as Victoria Biggs (2005) who wrote a book about her experiences.)

Visual and oral skills (Mainly dyspraxia)

Many dyspraxic students will have trouble keeping their place while reading and writing; they tend to have tracking problems caused by lack of co-ordination in the eye muscles. They cannot look easily from one place to another, e.g. from the whiteboard/screen to their notebook. They will often have difficulty finding the word that they need, and will find it very difficult to pronounce newly-introduced words, such as tsunami - so many will have difficulty learning foreign languages. They may also mispronounce words, for example pronouncing 'specific' as 'pacific'.

They may also talk indistinctly, or too quietly or loudly, or too fast or slowly, as well as interrupting inappropriately.

Numerical and mathematical skills (mainly dyspraxia)

Dyspraxic students have a tendency to reverse and miscopy numbers, signs and decimal points. They tend to make frequent and apparently 'careless' mistakes, although it is important to point out that as university or college students and employees, they will make enormous efforts to overcome this.
Geometry can be particularly difficult for people who are challenged by co-ordination, as they may find it hard using equipment such as compasses or protractors, or drawing geometric shapes. Their difficulties with spatial awareness and manual dexterity make it very hard for them to draw graphs, tables, circles and diagrams.

**Social and emotional difficulties (AD(H)D & Dyspraxia)**

Because of the issues with oral interaction and communication described above, dyspraxics and ADDers may not pick up hidden cues in conversation such as body language or 'hints'. ADDers may be over-talkative and excitable, while dyspraxics can struggle with reading body language – and with displaying it. The difficulty will be exacerbated by the low self-esteem and lack of confidence that many such students will have. Dyspraxics in particular, can find everything overwhelming, particularly the amount of work they have to do, and so do not want to socialise too much. Many will have emotional problems, such as depression, because of a lifetime of embarrassment and criticism.

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**At university, most people think you are at least by name, the typical uni student – much partying, drinking, working too, keen to get on with life, living in a student house, etc. I'm not. I'm in my second year, living in halls of residence (most 2nd years live in houses), and finding it stressful keeping up with the workload.  

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Melanie

Others eventually make close friends with a few people, who have similar interests. Ben for example, after a difficult start, made friends with other people studying philosophy like him, which gave his self-esteem a boost and he managed to obtain a upper second as a result (Colley 2006:99).

Dunford and Richards (2003) show that when children who are dyspraxic grow up, they are far more likely to be socially excluded and to have poor mental well-being, when compared with a similar non-dyspraxic group. Many ADDers and dyspraxics will find that taking alcohol and recreational drugs reduces stress, often leading to further substance misuse (Kilcarr 2001:40). According to Kessler (2004 cited in Brown 2005: 201-202), 88% per cent of ADDers have at least one additional psychiatric disorder. These include depression; anxiety disorders including Obsessive Compulsive Disorder; substance abuse disorder; oppositional disorders; and general psychiatric disorders.
Strengths and positive characteristics

As well as looking at the difficulties encountered by ADDers and dyspraxics, it is important to note that they also have strengths. On the positive side, dyspraxics and ADDers can be creative; artistic; original thinkers; and good at strategic thinking, lateral thinking and problem-solving. Many will be determined, hard-working and highly motivated – especially when they are particularly interested in a subject – and this can go some way to overcome their difficulties. Many will develop their own strategies to deal with some of their difficulties.

ADDers’ high levels of energy and their tendency to risk-take can enable them to make new discoveries; and their penchant for hyper-focusing may lead to them to see things that others do not. Many ADDers in particular also have entrepreneurial tendencies (Kirby 2007).

Finally, it is necessary to remember that very few dyspraxics or ADDers will experience all the challenges mentioned above. They should all be treated on an individual basis.

Transition and choosing the right college/university

ADDers and dyspraxics frequently find it daunting when they move from home to college. They will face new temptations such as alcohol and drugs; and if they have moved away from home, they will probably find it very difficult to cope with the routine tasks of everyday living on their own. Brown (2005:135) says that the separation from day-to-day contact with parents is hugely challenging. They will need support from both parents and schools, in the year before they leave, to help them prepare for this life-change (Hallowell & Ratey 2006:199-205).

If they leave home to study, they have no family around to help them organize their studies or their everyday life. If they are on medication, (e.g. for AD(H)D) they may have trouble organizing their medication. Because of their disorganisation, they will be even more likely than other students not to get enough sleep, which will exacerbate all their problems.

Brown (2005:136) provides a description of a typical ADDer student starting college:

When I actually got to campus it felt good; nobody really cared when I went to bed or when I got up or whether I ever went to class. Most nights I went out for beers with some guys from my dorm and smoked some weed on our way back. Back in my room I would stay on the internet as late as I wanted .... After a while I just gave up on going to classes. I was hopelessly behind. That’s how I failed all my classes. I got kicked out at the end of the year. (Brown 2005:136)
In the months running up to college, ADDers and dyspraxic students should arrange to look around the university/college individually. At this time, they could ask whether there are support groups, and they should arrange to visit the disability/dyslexia department, to see what services are offered. They should also look at what the student accommodation is like and whether there are any quiet places to study, such as carrels (small separate compartments) in the library.

They will also need advice on choosing suitable courses. If possible, they should look for a course that strongly motivates them and uses their creative skills, ideally one where the workload is relatively low. The heavier the course, the more overwhelming it can become for the student. They will, therefore, need to take into consideration how much reading and writing the course will involve. It is essential for all students to ensure that their chosen course matches their strengths and minimizes extreme challenges, but this is even more vital for those who experience learning differences.

*I chose to do a history degree with a wide choice of different historical periods to specialize in. The period I chose was the Middle Ages – in which I particularly chose a course on Medieval South-east Europe, partly because I was interested in it – but I have to admit also partly because there were very few books on the subject written in English – and I wasn’t expected to learn to read Bulgarian or Serbian! The alternative to this course would have been one on modern British history, which had an enormous number of books to read and would have been quite overwhelming for someone like me with dyspraxia and AD(H)D.* Mary

HELP AND SUPPORT

A strategic policy on disability and equality should also be in place, with provision for constant revision and enforcement. There should be a policy regarding neurodiversity in general, with a section on AD(H)D and dyspraxia specifically.

There is an urgent need for all college and university staff to fully accept the fact that AD(H)D and dyspraxia are real impairments, not just a lack of willpower or a behavioural issue. Academic staff need to learn to look out for typical signs of dyspraxia or AD(H)D. They may then refer students to learning support staff, but it is also vital for lecturers to convey awareness of neurodiversity to their students, so that disclosure of learning difference is encouraged and inclusive practices and adjustments can be put in place.
Another area that educational and support staff need to be aware of is how students are coping with general day-to-day living - such as money-management, hygiene, laundry and organizing their workspace and rooms - as these are likely to be a challenge for students with dyspraxia or AD(H)D. Many will need help with debt and other financial matters, as well as help to live more independently.

Many students will arrive at college without a formal identification, not knowing that they are experiencing a learning difference – or, if they do know, may not wish to declare it. Either way, they are likely to have poor self-esteem and will need a supportive university or college to help them tackle this. All counsellors should be trained to work with neurodiversity. Students may also need help from support staff to obtain formal identification, especially for AD(H)D.

**Student disability services**

The most appropriate place for dyspraxics and ADDers to obtain support should be their college’s learning support unit (which may come under something called Student Services, and may be linked to a disability team). These departments should provide assessment of students’ needs when necessary and help ADDers get a medical diagnosis, if they want to take medication.

Student Services should also offer a range of advice and practical support, including help with obtaining student grants, particularly the Disabled Students’ Allowance, as many students arrive without having organised this - mainly because they cannot afford to get the necessary educational psychologist’s report.

The student support department should also, with the student’s permission, inform tutors and lecturers of the student’s disability/learning difference and needs.

It is important that dyslexia and disability staff are properly trained and informed about both dyspraxia and AD(H)D. (Many know very little about AD(H)D). They should also be prepared to advocate with academic tutors or lecturers on behalf of dyspraxic and AD(H)D students. Other academic staff also need to receive effective staff development.

*I found the disability co-ordinator and staff really good, but the lecturers were really ignorant.*

Miranda
General accommodations in college courses

Lecturers should encourage dyspraxic and ADDer students in seminars and tutorials as much as possible – giving them extra time to frame and answer questions. Dyspraxics and ADDers also tend to need more time in general to complete their coursework. Staff need to understand that it takes the average dyspraxic/ADDer a far greater time, and much more effort than other students to prepare and write reports and essays.

There is a range of accommodations that staff should be aware of, that can help make college achievement less difficult and stressful for ADDers and dyspraxic students. Colley (2009) lists a number of ways to support AD(H)D students, which are equally applicable to dyspraxic students.

These include:

- giving students more feedback than average because of issues regarding memory and self-esteem
- as far as possible, giving them a distraction-free environment to work in (including the use of headphones to block out sound)
- provision of notes before lectures; or scribes to take notes for the students; or digital sound recorders
- encouraging ADDers and dyspraxics to sit at the front, where they can concentrate more easily and are less distracted by noise and movement (except for some ADDers, who like to be near a door so that they can go out for a while if they are getting restless)
- breaking down everything into little segments. The whole can seem overwhelming. Frequent breaks need to be taken as well as breaking tasks down into pieces
- availability of teaching and other materials in a variety of clearly laid-out formats (e.g. large sans serif fonts; bullet points, headings, tables, diagrams; lots of space; and the choice of coloured paper)
- the provision of carrels, (separate quiet sections in libraries) which can be extremely helpful to dyspraxic and ADDer students, because of their difficulty with concentrating and easy distractibility.
- help from tutors (both college tutors and specialist dyslexia/dyspraxia tutors) with prioritising books in reading lists.
- extensions of hand-in dates for dyspraxics and ADDers, if necessary, in order to keep on top of their workload
• good directions, clear maps and signposting around the library and the campus

• extra time during exams (which ADDers and dyspraxics are entitled to be given because of their slower processing speed)

• the option to use a computer during an exam, especially for dyspraxics, because their writing can be very slow and illegible

• The option for scribes to write or type their exams, especially if they have difficulty using computers (mainly dyspraxics)

• a separate quiet room for exams in order to avoid distractions.

Dyspraxic and AD(H)D students should also receive guidance from specialist dyslexia tutors, for example with planning coursework and essays, including the use of concept maps. Offering templates of other written essays and reports can be extremely helpful. Tutors should offer help with basic grammar, punctuation, paragraphing and writing structure, but training in proof-reading skills is essential. Such training is not, however, usually adequate on its own: it will help the students to spot far more mistakes – but in the end, not a sufficient amount. They may also need help from an outside proof-reader (Hallowell & Ratey 2006:37).

Tutors also need to help dyspraxic and ADDer students with memory techniques, skim-reading and scanning for information, as well as work-scheduling and time-management, in order to meet all their deadlines for handing in essays and coursework.

Learning & Teaching styles and techniques

‘Experience has demonstrated that adjustments made for disabled students can often benefit all students. Inclusive teaching is good teaching’ (Open University). There follow some examples of teaching that many ADDers and dyspraxics prefer.

Cooper & Bilton (2002:68) found that students who experience AD(H)D usually prefer an active, concrete learning style and the same is true for many dyspraxic students. They tend to learn better from interaction, observation and experience.

Colley(2009:183) writes: “Student-centred and interactive learning such as Problem Based Learning (Murray and Savin-Baden 1999) can be beneficial, particularly to ADDers, who often do not like authority. This teaching style can foster better understanding and retention of facts, and can motivate students. This is vital for students who have poor short term/working memories.”

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Multi-sensory teaching is essential, as it is with dyslexia. It helps students focus more easily on the subject. It is important that lectures are presented in a way that uses the visual, auditory and kinaesthetic modes. For example, videos, pictures, diagrams and concept maps help the visual learner; the auditory learner will benefit from a lecture that is delivered in a slow and audible manner; and the kinaesthetic learner will appreciate the lecturer being as interactive as possible, allowing the students actively to experiment and role-play the information. The provision of notes before a session can offer all these sensory modes – giving students printed notes to see and physically write on, at the same time as hearing the lecture being spoken.

‘Actually the more of my five senses that I use at a given time, the easier it is for me to solve something or pay attention.’ Peter

‘Over-teaching’ and repetition is also very important (Colley, 2009:183). Nothing should be left to the imagination. Everything needs to be spelt out clearly. The main points of the lecture need to be repeated. A flow-chart or concept map of the session should be used if possible. Students need to see the bigger picture. Slides should be as uncluttered as possible. Key learning outcomes need to made clear to the students - and they should be returned to at the end of the session (Crabtree, 2006:27-28).

Praise and understanding are also very important, because most dyspraxic and ADDer students have experienced misunderstanding and criticism which will have caused their self-esteem to plummet. Colley (2009:181) writes: “Maintaining empathy can be very difficult – for example, when the student has forgotten all his notes for a seminar for the umpteenth time. In such cases, it is best to make a neutral remark rather than a disparaging or hostile one. If the student is being disruptive and keeps interrupting in a seminar, it is best to stay as neutral as possible. Getting angry or sarcastic will only inflame the situation. Often a student will seem rude when in fact they do not mean to be at all.”

**Other help and Support**

Students may be in danger of becoming passive, and should be advised to help themselves. Learning support staff can advise them of the benefits of good nutrition, regular meals and taking omega 3 fatty acids. Regular exercise and relaxation are also very important for ADDers, as for all types of neurodiversity. Dyspraxics and ADDers can benefit greatly from yoga, meditation, Tai Chi, Brain Gym, or simply regular walking. The relaxation calms the mind and so enhances focus and concentration.
Technological hardware (mainly dyspraxia)

The provision of the correct technological hardware can be almost more important for the dyspraxic student than is the software. They may need computers with large, ergonomic monitors and keyboards. They also need chairs that allow them to sit in the correct position and at the right height to use the computer efficiently and comfortably. It is essential that dyspraxic students, where necessary, have computer mice that are easy to manipulate and control, as they often find it very difficult to use mice efficiently. They may need a larger mouse of a different shape, or an Anir mouse which is shaped like a joystick, or a roller ball mouse. Cordless mice are particularly helpful. These students may also benefit from the use of a laptop computer, so that they can work wherever they are, to make up for their slower working pace.

Because of their difficulty taking lecture notes, they will also benefit from a digital sound recorder - which is valuable for small group and individual meetings as well. The use of a scanner is also important, to enable them to copy text into computers, to be read aloud by appropriate software packages.

Technological software

Computer software can be highly beneficial to dyspraxic students and ADDers. However, they will need a lot of extra training in order to make full use of these packages. Helpful software packages include TextHelp Read and Write which, among other things, reads text aloud to help students revise and to check for errors in their writing; and planning software such as Mind Manager, Inspiration, Mindful or Mind Genius. Predictive text software such as Penpal can help greatly to cut down on typing errors that dyspraxic students frequently make, as well as helping to speed up their typing. Students should also learn how to add words to the Autocorrect tool in Microsoft word, to allow them to enter abbreviations for difficult spellings. Post it is a simple and easy aide-memoire that sits on the computer desktop. It can also be used to devise timetables and planners. Microsoft Publisher can be a very good program for students who are dyspraxic and much easier to use than other design programs, such as Quark Express. It has numerous templates for brochures, posters and newsletters etc., which if used correctly can produce professional-looking documents.

Equipment and gadgets (mainly dyspraxia)

There is a range of equipment and gadgets that can help dyspraxics and ADDers to work more efficiently.

Equipment to help mainly with course work

For both dyspraxics and ADDers:
**Watch Minder** is a normal watch with added functions. The watch can be programmed to make a sound at set times, to act as an external reminder to complete tasks.

**Palm top organizers**

**Digital mini disk recorders**

**Student Organiser Pack:** [www.calsc.co.uk](http://www.calsc.co.uk)

**Skoach:** a scheduling and organising tool designed for ADDers but also good for dyspraxic people. ‘It helps with planning tasks and has a ‘Task Tree’ function whereby tasks can be broken down into manageable steps. (.....) It also has a visual timeline which lets you gauge your progress which is great for staying on task. It even keeps track of interrupted or unfinished tasks, puts them back in the task list and lets you record last/next action which helps you stay on track’ (Linda Fox www.lindafotypepad.com).

**Microsoft Outlook** can also be a good organising tool.

Mainly for dyspraxics:

**Talking calculators** can help students check they have entered the correct figure, which is particularly important to dyspraxic students with their fine-motor and concentration difficulties. Calculators with large keys can be far easier to manipulate than those with typical small keys.

**Special compasses**, such as the circle scribe disk compass ([www.circlescribe.com](http://www.circlescribe.com)).

**Special scissors & trimmers** with large grips can make it easier to cut in straight lines.

**Corrective pens** such as Tippex

**Special pens** that are easier to hold and write with, such as those made by Berol or Pilot; these have large grips and are fibre-tipped.

**Rulers with a ridge down the middle** can be easier to manipulate.

Equipment to help mainly with everyday living (dyspraxic students)

**Diacem**, a type of sticky plastic, can be used to secure objects in the laboratory (or when cooking in student digs).
Cordless Kettles

Jar openers

Ergonomic potato-peelers

More information on these gadgets and many of the computer programs mentioned above can be obtained from the following places:

The Ergonomic Society: www.ergonomics.org.uk

The Dyscovery Centre: www.dyscovery.co.uk

Disability Living Foundation: www.dlf.org.uk

Nottingham Rehab Supplies: www.nrs-uk.co.uk

Iansyst: www.dyslexic.com

Social skills Training

This can be really useful for both dyspraxics and ADDers, in particular assertiveness training. This can help students to be less aggressive or passive, and build up their self-esteem and confidence. (It is important that others should understand that dyspraxics and ADDers can seem quite rude on occasions, but usually don't intend to be.)

Occupational and Perceptual therapy

Some dyspraxic students are being helped with these therapies at university. Occupational therapists can help with organisation and also with using the types of equipment listed above.

Mentoring

Mentoring can provide valuable support to dyspraxic and ADDer students. For example, it can help students with organisational challenges, which can be very great at times, and with building their self-esteem. It is often no good just telling a student how to plan and organise: they may need somebody to help them every day with life-skills and practical support.

My mentor is using this programme with me, and it's beginning to change my life. William

Counselling

Counselling - especially Cognitive Behavioural Therapy (CBT), or neuro-linguistic programming (NLP) - can make a real difference to ADDer and
dyspraxic students. Other types of more discursive therapy can be counter-productive and frustrating.

| I couldn’t get a handle on my studies until my counsellor sat down with me and explained thoroughly (...) what areas are affected by ADD. A junior history major (cited in Nadeau ed. 1995:299) |

A CBT programme designed specifically for ADDers (and also very helpful for dyspraxic people) has been produced by two AD(H)D specialists, Susan Young and Jessica Bramham. The programme is called *AD(H)D in Adults: A psychological guide to practice* (2007.) The programme includes combating negative thinking; anger and anxiety management; social skills training; time management and prioritisation; problem-solving; and relaxation therapy. There is a companion website with downloadable materials for clients and therapists.

The section of the programme on time management is different from other time management training, in that a reward system is incorporated into the time planning process. A time plan is made of progressive small steps towards set goals and includes external strategies, such as using alarm clocks and mobile phones.

**Diet**

Diet can make a big difference. For example, fatty acid supplements such as *Eye q* and *MorEPA* can aid concentration and memory. (For more information on this, see Richardson 2003b).

Dyspraxics, especially if they have overlapping Autistic Spectrum Disorder, are more likely than others to have intolerances to wheat and dairy products, so omitting these products from the diet can be beneficial (Shattock et al. 2001).

**Coaching**

Coaching is another intervention that can help. There are now specialist ADD coaches available in the UK, and some of them are helping ADDers and dyspraxics in university. They help to organise the everyday life of students - rather than their academic life - which is what is needed by many such students. Much of the work is done by phone and/or email, so distance is not a problem unless the student wants to meet face to face (though such meetings usually take place at the beginning of a professional relationship). Phone calls will usually be at regular times and ‘homework’ is given between sessions.

A coach acts as a partner, and not as a counsellor or parent, to provide the structure and support that students need in their everyday life. They help get the student into a routine, for example, establishing regular
times to get up and to take meals. They may help establish regular times for students to de-clutter their room and files. Coaches also work with students to try to improve their social interaction. They may use role-play to help with a difficult encounter that the student has to face in the near future. Many ADDers, for example, are impulsive, and if they have been upset, may do or say something they regret. Coaches are there to point out the consequences that their actions may incur.

Coaches are there to encourage, not to nag. They can monitor the student and ensure that they follow through on strategies and routines that have been set up. To do this on their own can be a real struggle for ADDers and dyspraxics.

**Medication**

For ADDer students, medication can alleviate some of the core features of their learning difference. It can help greatly to calm them down, and can benefit their performance in various ways. For example, it can improve their communication, motivation and concentration – for some, enabling them to gain qualifications when everything else has failed. Medication can also make them more responsive to other interventions.

_I have to thank Ritalin for my university qualifications._ Jennifer

Stimulants such as methylphenidate (MPH) (Ritalin) or dexamphetamine (Dexedrine) are the main medications used in the UK. Most people start on MPH. A slow release variety of MPH called Concerta only needs to be taken once a day, which is helpful for those who find it difficult to remember to take their medication. A non-stimulant drug that helps ADDers is also available (Atomoxetine/ Strattera).

However, some people cannot, or choose not, to use medication – and for some the medication does not work. Sometimes the side-effects may prove too much. Some common side-effects are headaches, insomnia, weight-loss, nausea, and anxiety. Some fear the possible addictive properties of medication. Others may fear the medication will hamper their spontaneity or creativity. There is also the issue of remembering to take medication, which can be particularly hard for ADDers when they are stressed – which is when they need it the most.

However, in most cases, medication is not the answer on its own. It should be used in conjunction with other strategies, including those mentioned above.

Finally, some ADDers and Dyspraxics can find anti-depressants and anti-anxiety medication useful at times.
Conclusion

AD(H)D and Dyspraxia often overlap with other types of neurodiversity. They both have numerous effects on university students, not only academic, but also emotional and social. There are a great many undiagnosed dyspraxics and ADDers at university who are not meeting their full potential – particularly amongst those diagnosed as dyslexic – and university staff need to be aware of this. With greater staff awareness, there will be more likelihood of screening and proper assessment taking place.

There are many ways to help ADDers and dyspraxics. University authorities and staff can accommodate, teach and support them and enable them to meet their potential. Psychological interventions, including coaching and counselling can be helpful, as well as medical interventions. However, as with all types of neurodiversity, the most effective way forward is for the FE &HE environment to be as accessible and inclusive to all as possible.

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Sources of Further Information

Websites

www.adders.org  An organisation based in the UK. Includes many very useful articles on all aspects of ADHD, e.g. on how to go about getting a diagnosis on the NHS

www.addiss.co.uk  Attention Deficit Disorder Information Services; one of the UK’s leading organisations for ADHD

www.chadd.org  Children and Adults with Attention Deficit Disorder. The US leading organisation on AD(H)D. Articles on all aspects of ADHD, including coaching

www.additudemag.com  Contains the latest information and features on AD(H)D

www.key4learning  A UK-based site for matters relating to neurodiversity especially in the workplace

www.drtomthomasbrown.com  The site of Dr Tom Brown with latest opinion and information on ADHD
www.lindafox.typepad.com The website for UK-based coach Linda Fox

www.oneaddplace.com Contains a comprehensive ADD screening test for adults written by Dr Daniel Amen

www.add.org The Attention Deficit Disorder Association; a US-based group for adults with AD(H)D

www.addplanner.com A software planner specially devised for adult ADDers. Users can programme it with appointments and be given a warning about how much time they have. Useful for those who like assertive technology

Support Groups

DANDA Developmental Adult Neurodiversity Association runs groups for adults with dyspraxia, ADHD, dyslexia and Asperger’s. Active mainly in London, but can sometimes put people in touch with groups elsewhere. www.danda.org.uk Tel 020 7435 7891

ADHD Group Harrow, Middlesex Tel 020 8426 1719

Adult Attention Deficit Disorder UK A new organisation which has groups for adults in London and Bristol. Tel 01934 863556 (Bristol group). www.aadd.org.uk

Dyspraxia Foundation Tel 01462 545986
Feeling special - a grown-up's guide: reflections arising from adult diagnosis of dyspraxia

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Abstract

A personal reflection on the experience of an adult diagnosis of dyspraxia forms the background to suggestions for developing inclusive environments for neurodiverse students and employees. The emphasis is on suggestions rather than prescriptions, because the author is aware that issues of identity, personal experiences and influences should not be over-generalised.

Introduction

In this article, I aim to embrace an emancipatory approach (Oliver 1990) by discussing my own experience, with a view to assisting practitioners who work with disabled people. By sharing this information I am inviting reflection on practices and behaviours, which may help or harm self-esteem, may include or exclude, foster a sense of belonging or a feeling of being 'othered' - that is to say, set apart as 'different'. The health warning that goes with this piece is that I own my life story and my history and feelings are unique to me, therefore may have no application beyond my own sphere of existence. My 'diagnosis' is dyspraxia and I do not plan to use the 'they' word, which would imply that everyone who has dyspraxia is like me. My sense of identity is unique to me, and I am supporting the contention of Barnes (2008) and others, that a sense of identity as a disabled person is not a straightforward thing.

This article adopts a Social Model of Disability stance, in which people with impairments are deemed to be disabled by obstacles in society, rather than by being characterised, as with the Medical Model, as faulty, and in need of fixing (Barnes 2004; Barton 2004; DePoy and Gilson 2003, Oliver 2004). The word 'impairment' is interesting in itself. Individuals, who are positive about neurodiversity as encompassing non-neurotypical ways of being that bring a range of strengths including, critically, the ability to think strategically, and to see the bigger picture, may reject the term. Disabling negative attitudes may, however, have impacted on the life experience of even the most positive and resilient neurodiverse person (Pollak 2005).

A Definition of Dyspraxia

I find it very hard to relate my ways of being in the world to a clinically recognised definition of dyspraxia, but understand that providing this information, however self-consciously, will be of benefit to the reader:
Dyspraxia is a delay or disorder of the planning and or execution of complex movements. (...) Associated with this may be problems of language, perception, and thought. (Colley 2006 p15)

Oh dear...I'll get my coat. The good news is that people who are dyspraxic can be 'creative, determined, original and hard working' (Colley 2006 p20). Less thrilling is the catalogue of attributes it is harder to feel positive about. These include difficulty with: balance, posture, rhythm, hand/eye co-ordination, telling left from right, driving, writing, participating in sports and visual perception (Colley 2006, Kirby 2006). There are many more things of a similar ilk on these lists which feel rather embarrassing when I apply them to myself. Politically, I am embarrassed about being embarrassed about this, but to be dishonest about how I feel would make me worry about lacking integrity. Emotionally, this is a difficult article to write.

A Case Study

I know a highly qualified university senior manager who is an able academic, researcher, writer and teacher. This person is always in demand nationally and internationally, mainly because of their ability as a conference speaker, and reviews of conference contributions are consistently good.

I know someone who failed the Eleven Plus exam thirty-something years ago and still feels defined by the experience. This person has got a good job now and works very hard, achieving, by their own reckoning, a modicum of success.

I know a person who has a hidden impairment and is described by a friend with a visible impairment as an invisible. This person feels comfortable around disabled people, but usually not comfortable enough to 'disclose'. This is in part due to feelings around hierarchy of impairment, uncertain disability identity (Barnes 2008), and a feeling of a danger of Impostor Syndrome (Corkingdale 2008). It’s not a competition, but complaining about dyspraxia to someone who has multiple obvious impairments feels socially awkward.

The three people I’ve just described have something fairly fundamental in common: they are all me.

I take issue with the term 'case study', as I feel that I am an individual rather than a case and that the terminology of the 'case' is pathologising. Much of the language I come across in reading about dyspraxia and specific learning difference causes me to react emotionally at this point, eighteen months after my own 'diagnosis' in adulthood. 'Diagnosis' is one of those words. So too are the following: 'disorder' (Dewey 1995), 'handicap' (Kirby 1999), 'co-morbid' (Jeffries and Everatt 2004), and
'treatment' (Pauc and Norris (2008). I don't really like 'their brains are wired differently' (Thomas 2006) mainly because of the use of 'they' as in 'them and us', the 'abnormal and the normal', the neurodiverse and the neurotypical.

My 'case notes' might read: 'N presents as a short, middle-aged, comorbid, handicapped, disordered dyslexic dyspraxic Eleven Plus failure, in need of treatment for a differently wired brain'. I don't really see myself that way.

The question of whether I consider myself to be disabled however, isn't really that simple. Barnes (2008) and others reflect the view that disability identity is a complex and multi-faceted construct. As part of my multiple identities, my dyspraxia is low on a long list. If asked to describe myself with 'I am' statements, I would start with 'I am a mother'.

Self Esteem and 'Othering'

My 'labels' include dyspraxia, short person and Eleven Plus failure, but not necessarily in that order. Unable to read at the age of twelve, diagnosis of dyslexia came first but fairly late, while I was studying for a Master's degree at the age of twenty-five. My childhood gifted me with solid foundations and ameliorated much of the potential damage the education system could have caused me. It wasn't my family that damaged my self esteem, it was the experience of failing the Eleven Plus, being the last to be chosen for PE every time and being 'kept down' a year (because I was a July baby) after I was transferred to the Grammar school following a year in the Secondary Modern, during which I learned to read adequately (but not to spell).

The negative impacts of some forms of neurodiversity (most frequently dyslexia) on self-esteem are fairly well documented, with much of the literature focussing on children and schools (Baker et al 2007; Burden 2008; Humphrey 2003; Kirby et al 2005; Ridsdale 2004; Singer 2008) and much of the language uses a list of impairment labels. A growing body of work, which considers ideas around inclusion and the emotional well-being of school children who experience neurodiversity, is encouraging to an extent (Coldfield and O'Neill 2004; Gott 2003; Jones 2005; Lewis and Norwich 2004; Penketh 2007), but work which focuses on the post-school context is patchy to say the least.

The current 'poster boy' for dyspraxia is probably Max Kaufman who, after appearing on University Challenge for Christ Church College Oxford, was the subject of an unfortunately titled article in the Telegraph by Max Davidson (2008): 'Dyspraxia: clumsy but clever'. It is questionable whether Davidson's motivation had anything to do with self-esteem, but the piece was peppered with words like 'hopeless'.

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It is possible that the life experience of many neurodiverse older people may include Eleven Plus failure, but there is not, at this stage, a sound research base to substantiate this claim. Acquiring the status of Eleven Plus failure did of course, for the individuals concerned, necessarily result in embarking at that tender age on a form of segregated education for the masses, deemed to be less intelligent than the elite who made it to the grammar school. The potential limitations to employment choices that this implies do not need to be spelled out. John Prescott (2008) is quite eloquent on the subject, as an Eleven Plus failure himself.

I felt very special in my family, as none of my three siblings were like me. None of my relatives ever made a big deal out of my brief diversion via the Secondary Modern school. When I moved, I got called a snob by my former classmates and had to wear a very embarrassing uniform. An uncomfortable sense of being an impostor settled on me, but this was ninety percent manageable, although I harboured an uneasy feeling that my parents, both teachers, had pulled some strings. The unmanageable ten percent was around PE. Bad spelling was between me and my teachers. Public humiliation is by definition public and, as well as being chosen last for teams every time without exception, I earned the title of 'class clown' for my genuine attempt to get a hockey ball into a goal which missed by miles. I did feel very special when it came to PE. There is very little written about the specific impact on self-esteem of the PE experience I have described, but if ever I ask people to recall a humiliating childhood event at conferences, this always comes up. Recalling the occasion, people describe feeling physically sick, experiencing a tightening sensation in the chest and being 'gutted'. My inviting conference participants to share in this activity is not an act of cruelty, but is rather an exercise in empathy, based on the assumption that, in order to begin to understand the potential impact of one's actions on someone else, it is helpful to stand in their shoes - to embrace their world view. It is possible that my view of myself in the world is influenced particularly by being 'special', in the sense of being 'othered' at a time in my life when, like any teenager, I wanted to fit in, not to stand out. Describing me as the class clown indicates how comprehensively the PE teacher didn't get this - and didn't get me.

I do not feel defined by my impairment, but I do feel that other people's reactions to my perceived failings or assumed motivation in the past have had an impact on my emotional development. I'm a grown-up now and as long as I avoid line dancing, aerobics, team sports, barn dances and the like, I keep my PE-fuelled resentment under control. I maintain my fitness by walking, not by joining in. My emotional reaction to something which occurred (albeit regularly) more than half a lifetime ago also feels very silly at my age, and I am uncomfortable about the hierarchy of impairment thing. Not being able to catch a ball has very little real impact on my everyday life. Being an under-confident driver with no sense of direction is more of a nuisance. If I hadn't got to the grammar school in
the end, I suppose I would probably not be a senior academic now. Who knows? I suspect I would have gone down the Widening Participation route, via an Access Course - or I could have explored the class clown persona and joined the circus (probably not - I don't have the co-ordination).

There is evidence to suggest that attitudinal barriers do limit life chances (Madriaga 2006; NIACE 2008). Occupational standards, which imply that people labelled with 'specific learning difficulty' can't succeed in branches of the medical profession, for example, are inherently disabling, if they prevent access to appropriate courses of study (Dale and Aiken 2007; Hoong Sin et al. 2008; Murphy 2008). Reasonable adjustments at work, currently dependant on disclosure, could be compromised because of fear of resulting discrimination (NIACE 2008). It is impossible to know how many people have been put off going for their preferred career because of self-esteem damaging school experiences, jokes and teasing at their expense from family or peers and the like. I'm lucky I managed to enter the teaching profession in 1982 without any sort of diagnosis. It is possible, had my 'condition' been formally identified at this stage, someone might have stopped me. The experience of attitudinal barriers is most frequently cited by disabled people (Barnes 2004; Barton 2004; Oliver 2004; Gradwell 1997; Madriaga 2006). Access to the academy isn't all about ramps.

University students are frequently identified as dyslexic during their first degree, so diagnosis is often a recent and raw experience, and graduates may well complete their studies and then enter the workplace with unresolved feelings, including low self-esteem (www.brainhe.com; Pollak 2005). Other forms of neurodiversity are rarely diagnosed at university, because the funding regime and available expertise militates against this (as evidenced by commentary from disability professionals communicating via the NADP email list). Practitioners need to consider post-diagnostic support and the inequity of comparatively easy access to dyslexia assessment.

The Diagnostic Experience

I was unusual in that my diagnosis of dyspraxia occurred while I worked at a university, almost by accident. Essentially, I volunteered while a protocol was being trialled, because I had a feeling that I may well, very mildly and almost imperceptibly, exhibit some characteristics associated with dyspraxia. Unusual also, was the fact that there was nothing specific hanging on my gaining a diagnosis as a passport to any sort of service. When I was asked about my developmental history, it was nearly impossible to shut me up. As a baby, I shuffled rather than crawled and some recent viewing of home movies from my childhood revealed how very unusual this looked. I remember having real difficulty working out which shoe went on which foot and how to tie my laces. When I was
doing Domestic Science O Level, my father said that every recipe started with 'take a three pound bag of flour and throw it around the kitchen'. Left and right are a complete mystery, and as a child my mother had to spend hours helping me to work out which side of the paper I should start my writing from. I still worry about crossing the road, and consider one of my greatest achievements to be not killing my three toddlers, as I manoeuvred my triplet buggy across Berlin roads with no real idea about where the traffic would come from. I am not very good with an analogue clock. My handwriting is hard to read and I am untidy. My junior school teachers used words and phrases like 'disgraceful' and 'you should be ashamed of your untidy work' in their feedback on my creative writing. Learning new ICT skills takes me a long time because the icons on the screen make no sense to me, so I navigate the menu using the words only. Flat pack furniture assembly is something I would pay someone else to do, and I trash at least two vacuum cleaners a year, not through excessive use, but because the diagrams about how to replace the bag seems to be telling me to break bits off. Rubik's cubes and jigsaws have to be completed with the aid of a hammer, or better still, left well alone. Magic eye pictures mean nothing to me and I really hated reading 'Where's Wally' books to my children because I never managed to spot the cheeky chap. I can't walk in a straight line; I avoid heights and have very poor perception of space. Given the choice between bungee jumping and running naked around Trafalgar Square, I would be more comfortable with the latter (preferably with a bag over my head).

This negative reminiscence work has to stop now, because I am getting those sickly feelings of being tight-chested and light-headed. The incomplete list I have just recorded makes me feel other and special and I don't like it at all. In the interest of balance, there are also some things I am good at.

Reliability is something which I value in others, have instilled in my children, and display in abundance myself. I am always on time and I don't miss deadlines. If I have a poor short-term memory, it does not translate into being a nuisance to other people, because I write things down. As a strategic planner, I am very good at making connections between seemingly disparate strands. I am not a mind-mapper in the visual sense, but I do practice the art of joined-up thinking. My communication skills are good and I am able to engage people's interest when I give lectures and conference presentations. Hard work does not faze me, which is very lucky really, as I do have to work very hard to keep on top of emails, filing, admin and housework. I would have coped well with being really wealthy, so that I could devote myself to being a visionary, while delegating the tidying up to other people.

My diagnostic assessment for dyspraxia disabused me of the notion that I had a mild form of the 'condition'. (The word 'condition' makes me feel 'other' and 'special'.) Finding myself in the first centile for particular skills was quite a shock because, during an 'embedded form' test, I came to the
conclusion that I could actually do it if I put my mind to it. I didn’t get any of those right. The experience made me realise that I actually have no idea at all how people without my 'condition', perceive the world. This realisation made me feel acutely self-conscious and doubtful about my own abilities. I also questioned my own emotional intelligence, because I could not work out how I could really empathise with others if I was so unlike them - and they were nothing like me. Of course, in the contexts in which I operate, I didn’t experience any sort of stigmatization, but the diagnosis did precipitate another sort of crisis of identity. I have not grown into having a self-concept around myself as a disabled person, and I don’t feel like a non-disabled person either. The consideration for practitioners I think, in relation to post-diagnostic support, is how to address going further than ensuring that the diagnosis opens up entitlement to services. An effective system clearly needs to encompass an holistic view of a person, who may well require some help to deal with a shifting identity. Colleagues within counselling services may need to develop their understanding, in order to be suitably positioned to meet this requirement. I was very lucky, because I have close friends and colleagues, who are steeped in an understanding of disability politics. Despite feeling uncertain about who I am and where I belong, I have a safety net of very supportive, thoughtful and informed people. Although I am a self-conscious apologetic invisible, I have never felt excluded by disabled people.

While there are those who are able to embrace and celebrate their neurodiversity, entering post-compulsory education or the world of work, with a hangover of negativity and damaged self esteem, is a reality for many people with specific learning difference labels (Pollak 2005). With a move towards inclusive practice, in education and in the workplace, arguably the requirement for diagnostic labels as a way of accessing assistance should diminish over time. It is worth reflecting on what an inclusive environment might look like.

Towards Inclusive Practice at College, University and Work

The inclusive college, university or workplace could be characterised by being an environment in which 'put downs' and day to day humiliations are not part of the culture and a level of sensitivity operates which enables everyone to do the best job they can. Positive action to ameliorate the impact of earlier negative experiences, an ethos of celebrating diversity and fostering a sense of belonging, and a culture of sound inclusive practice is necessary to militate against othering. Within a truly inclusive organisation, smokers would not be made to feel unclean, and would not inflict their smoke on others. People could tuck into cheesecake at coffee time without anyone passing fat comments, vegetarians would not have to explain their position and bumping into things would not be worthy of comment. New staff and students would be inducted and mentored, rather than being left to sink or swim. Helping
everyone to find their place in the organisation would assist each individual to achieve their best, facilitate team work, and lead to greater efficiency overall.

I am embarrassed when I have to ask about the intricacies of the intranet at my university for example, because I know that 'at my level' I am expected to get it. The first lecture I gave was carefully planned, well-researched and inclusively presented, but I nearly failed to find the right room, because I could not remember how to access my personal timetable on the intranet. My work environment is a supportive one but, in contrast, the British Workplace Behaviours Survey (2008), which involved almost 4000 workers, found 'harassment at work, including humiliation, low expectations and unfair criticism', to be a common experience for disabled people (www.equalityhumanrights.com). In order to empathise with the experience, remember the last time you felt really humiliated, and consider how difficult you might find it to study or do your job while in the resulting emotional state.

**Good Practice Suggestions**

A few examples follow, which focus on fairly generic office /lecture contexts, but may well apply in a range of settings. The list presented is not intended to be exhaustive by any means, but rather is offered as a stimulant to encourage reflection, with a view to positive action.

**New situations /induction**

- As a starting point, careful strategic consideration of ways in which people are discouraged from even getting to first base is necessary, in order to reduce unseen discrimination which puts disabled people off applying at all. An entitlement, rather than reasonable adjustment culture is more conducive to disability equality.
- Induction is critical for students or employees. As expectations change at each level, students benefit from being inducted into each year. Providing clear information about (entitlement-based) services available to assist disabled people should be built in. For this to be effective, a thorough understanding of systems such as Disabled Students' Allowance and Access to Work, by those responsible for induction, is necessary.
- 'Access to Work' is designed to help disabled people to make the best contribution possible to the workforce and Human Resources colleagues need to be fully informed in order to provide appropriate advice. Developments are proposed which will make the scheme more widely available (www.dwp.gov.uk/noonewrittenoff). In an almost ideal world, a smooth progression, for example from Disabled Students' Allowance at University to Access to Work in employment, would be standard.
- Confidentiality is a matter of trust; breaking that trust can result in feelings of having lost control of one’s own personal information.
• Getting to grips with a new computer system can be problematic. Assuming that many people will not understand all of the ICT instructions first time around is realistic. The 'othering' sense of struggling on while feeling embarrassed about asking again is easily avoided. Assuming that everyone is necessarily able to play about with a computer until they just work it all out is bordering on cruel.

• ICT trainers need to empathise with what the individual needs to know, rather than impart additional confusing information. Step-by-step bullet point instructions are often helpful, and building ICT induction into the first few weeks as a matter of course is a way of avoiding the situation where the student or employee has to pretend they know what they are doing.

• Everyday embarrassments include not knowing which way up the paper goes in the fax machine or the printer. It would be sensitive to place step-by-step instructions by such equipment, as a matter of normal practice.

• Productive follow-up activities post-induction, and/or a sensitive mentoring system, could assist a student or employee in their development of autonomy.

Communications

• Clarity in all forms of communication is important, but demands a level of empathy on the part of the person initiating the interaction.

• Someone who is dyspraxic is very likely to experience short-term memory problems (Colley 2006; Grant 2007; Pollak 2005), as is anyone who is dyslexic, is highly stressed or anxious, or not heading back to their office straight away following an important corridor conversation. A culture which makes it OK to say 'I am not going to remember what you have just told me, so you need to email me with what we have agreed' could save a lot of worry.

• It would be helpful to avoid practices which result in everyone receiving over a hundred emails a day, including over thirty which were just 'copying in' for no valid reason.

• Clear subject headings make emails more efficient and sortable.

• Rather than making a sarcastic comment, using the same number of words to answer the question about how that bit of ICT works is always more productive.

• Jokes at other people’s expense are rarely funny, and managers and peers can communicate an expectation that diversity is valued and take action to make this a reality.

Organisation

• A reliable system of accessing papers in advance for meetings (such as providing them as a single email attachment) could reduce the stress of searching. Presenting materials so that they are accessible to screen-readers, modification of font and colour, and other necessary manipulations, is also reasonable and easy. (www.techdis.ac.uk).
• ICT-based props for time management include the Outlook Calendar. A wall planner, which everyone uses reliably, could be a non-technological solution.

• A team-based system for filing, in which each member takes responsibility for one set of information, could greatly enhance efficiency. A time-consuming and inefficient task could be made manageable fairly simply, with a complete set of information stored in an agreed place, and backed up electronically.

• A culture of reliability encourages everyone to be reliable. Helping people to find ways to complete the tasks, for which they are responsible, is less patronising and more productive than having low expectations. Having clearly articulated roles for all participants in team tasks is helpful.

• Assistive technology may well be of great benefit to whole teams. It does not have to have anything to do with disability.

Conclusion

The good practice suggestions provided in the previous section are presented with a health warning. Self-esteem cannot easily be mended with the application of a sticking plaster and it would be easy to read the list above, slap a laminated note by the printer saying 'the paper goes this way up' and think 'job done'. A cultural change is necessary; we need an inclusive environment in which neurodiversity is celebrated as an aspect of diversity that brings with it a range of positives and benefits. From my personal experience, I would suggest that, in order to contribute most effectively, neurodiverse individuals, like anyone else, require respectful treatment from colleagues and reliable backup from systems. Suggestions for inclusive practice offered here, clearly have broader application beyond the sector of the population labelled as neurodiverse; inclusive practice for neurodiversity is good practice for all.

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Paradox and conflicting identities in Disability Service Provision in Higher education: a personal reflection.

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Introduction

As an undergraduate dyslexic student in the early 1990s, I do not recall being aware of any dedicated support services, which may have assisted me during my studies. Nor was I aware of any other students who experienced dyslexia or hidden impairments amongst my peer group. On the one occasion that I did request some support, (during my final examinations) this was granted to me. However, the experience of being identified by the invigilator as a person requiring extra time, because of being dyslexic (out loud and in front of the rest of the full exam hall) was somewhat less than ideal. As a neurodiverse learner, I faced a number of challenges, as I am sure did a much larger proportion of my peer group than I was aware of at the time. I am also sure many students, with similar or more complex needs than myself, met those challenges and succeeded. However, my guess is that these successes came despite the lack of available support (or a lack of awareness of this support), whilst other disabled students may not have succeeded because of the less inclusive environment of the times.

It is pleasing and encouraging that the numbers of students declaring a disability have increased by a factor of more than ten since I ceased being a student (HESA, 2008), spurred by the changing legislation of the Disability Discrimination Acts (HMSO 2001, 2005), and other work to promote inclusive practice in higher education (for example Waterfield and West 2002). Alongside the growth in the numbers of disabled students accessing higher education, has come a growth in the volume and variety of the services offered to support students, including the rapid growth of the funds available through the Disabled Students’ Allowance. On reflection, I would have welcomed the chance to access and explore the kinds of support services which are now available in most higher education institutions.

However, having managed two disability services within higher education, and given the perspective that my past experiences have given me about the importance of disability service provision, I still often find myself at the centre of an ethical and professional conflict. I ask the questions:

A) could it be that the same services which campaign for inclusion have become another barrier which disabled students must negotiate?
B) could the roles and identities which disability services adopt actually contradict the promotion of inclusion?
C) could the above be involved in the failure of universities comprehensively to adopt accessibility and inclusivity into their mainstream planning?

The intention of this article is not to diminish the significance of the dedicated and expert colleagues I have in this field. Nor do I argue for the abandonment of disability service provision and support in higher education. I want to look in more depth at the multiple identities and roles of disability service providers and at the cause of the competing (and often contradictory) pressures these services face, when asking them to adopt these roles. In particular, I want to consider whether these roles and identities perpetuate a model of separation between disabled and non-disabled students.

Despite my personal and professional experience, I think it is important for me to locate my own views about what constitute disability. I believe the concept of neurodiversity is an important paradigm and a constructive way of addressing issues of inclusivity within higher education. Neurodiversity recognises that a person can have a profile of differing strengths or skills and face different challenges (some of which are placed upon them by the context in which they study) in certain areas of learning, communicating and understanding. Neurodiverse people provide a definition of what we might consider as neurodiversity:

"The Neuro-Diverse (NDs), have a cognitive profile, which shows many peaks and troughs, denoting significant disparity between the best and worst of their information processing (NB This is different from the case of having a uniform low level of performance throughout). The processing differences are present from birth, and are independent of any basic physical malfunctions, for example, of eyes, ears or limbs. It is thought that 10% of the population are significantly ND, with many more having some degree of neuro-divergence" (DANDA 2008).

Grant (2009:35) expands on this definition, arguing that neurodiversity:

"...is a positive statement of differentiation, for while it explicitly refers to individuals whose everyday ways of thinking and behaving differ in certain key aspects from the majority of people, it rejects the assumptions that’s these difference are dysfunctional and are to be ‘cured’".

The recognition that neurodiversity is not an expression of deficiency or weakness, but requires higher education to recognise difference and diversity in thinking, learning and communication styles, also provides us with a positive model to address issues of inclusion. It forces us to look away from remediation or correction of neurodiverse individuals, (changing them to fit in with a sometimes monolithic system) and instead
asks education providers to consider how their established methodologies may require change or increase in breadth, which recognises the differing skills and expressions of excellence that such individuals can bring.

I also believe that the most relevant model of disability to higher education is the social model (Oliver M, 1990). Students with an impairment will face a number of challenges in studying. The social model recognises that a person's impairment may be part of these challenges, but also emphasises the importance of the context or situation in placing barriers (which are the principal factors which disable them) to a person relative to their impairment. The regulations, procedures and policies that a university adopts, along with the methods it employs for learning, teaching and assessment are therefore potential barriers which a disabled student may have to negotiate. It is the position of the disability service provider, as either part of the solution to removing these barriers, or as part of system which in itself poses additional barriers for disabled students, which I address below.

In order to understand fully the kinds of roles adopted by disability service providers, it is helpful to understand the differing influences and pressures which can shape a service provision within an institution. The following diagram maps some of these pressures and influences.
Figure 1. Influence map on Disability Service providers

Recognising that a disability service provider is a servant of many masters (each of whom bring different and often competing demands to the service) is important in understanding the structure of disability service provision. Meeting these demands, coming from different directions of pressure, asks disability service providers to adopt different roles. I identify three of these roles below and look at them in the context of the questions I have posed above.
These roles are that of the **Procurer**, the **Advocate/Activist**, and the **Adjudicator/Verifier**. In looking at these roles and identities, I consider disability service providers in their broadest sense, including any officer or agency, which may play a defined role in working with students who are considered by their institution to be disabled.

**The Procurer**

The disability service provider acts as an agent through which support services can be obtained. This could include providing suitable specialist personal support and arranging for specialist technology or equipment. Specialist support services have a vital role to play for many students, such as the provision of material in accessible formats, access to a qualified mentor or advisor or a practical learning support assistant.

Underpinning many of these activities is the Disabled Students’ Allowance (DSA), where the disability service (as a Procurer) looks to the student to fund the cost of their support requirements. On the one hand, the DSA allows students to have access to assistive technology and equipment, which is very often vital to their success as a student. In the case of computer programmes designed to assist and harness the strengths of the neurodiverse learner, this is self-evident. In this light, the DSA (awarded directly to the student and not to the institution) could be viewed as empowering and enabling. However, the barriers posed by many of the learning, teaching and assessment methodologies faced by disabled students often cause the DSA to be necessary. In this light, the support offered to students (which is provided through disability services and charged to the DSA) offers us a paradox. The student is being asked to pay for the privilege of being able to access the support services they require in order to study, because the institution itself has created a barrier to the disabled student.

We can look in more depth at some services typically funded through the DSA, which illustrate the barriers a neurodiverse/disabled student may face in a neuro-typical environment.

The provision of note-taking services, to record the content of formal lectures in an accessible format, can often be of vital importance. There are a variety of reasons why a disabled or neurodiverse student may require this support. Physical or sensory impairments may, on a practical level, prevent the student taking notes in a lecture theatre situation. A dyslexic or dyspraxic learner may often find these formal taught situations an inaccessible learning context.

However, note-taking is not the only way in which a student can be supported or included in the formal context of lectures and teaching. There are a number of strategies which an academic can employ, to allow
students to have a record of the taught sessions. The provision of lecture
notes, in an accessible format in advance of lectures, can allow a disabled
learner time to familiarise themselves with the up-coming subject matter
and to get the maximum benefit from the lecture. The technology to allow
both the audio and visual recording of a formal lecture is perfectly
possible. Enabling a student to see/hear a replay of the taught
component provides a record of the lecture. Additionally, this method of
recording could easily be stored and disseminated for all students to
benefit from. So in this respect, one could argue that the need for the
student to spend their DSA on any form of note-taking could be
removed, should a combination of suitable adjustments be made in
learning and teaching delivery.

There are a number of reasons why an institution may choose not to
adopt this strategy. Firstly, it requires infrastructural development, which
is not currently necessary, because it is the student who is paying for the
support they need. Secondly, academic staff often raise the concern that
having too many resources available to the student, either in terms of
prior preparation or records of lectures, might stop the student physically
attending lectures. Issues of intellectual property may also prove a
stumbling block, alongside a desire to avoid the pressure of having one’s
performance recorded. Yet here is an example of the paradox faced by
disability service providers. By supplying the note-taking support for the
student, the individual is granted a level of access to their course which
the service is the key agent in providing. But supplying this support also
removes the need for institutional cultural change and the removal of
barriers through the adoption of inclusive practice. The emphasis remains
on the student to “buy” their own equality, and the disability service is
part of the system which “sells” this.

The provision of study skills support occupies a similarly contested space
to that of note-taking services. On the one hand, effective and student-
focused study support may be of critical importance in assisting a disabled
student to develop strategies and harness their strengths to enable the
production of written work. Yet the basis of many study skills support
sessions is to enable the student to undertake the two most typical types
of formal assessment activity, i.e. writing essays under exam conditions
and producing assignments under coursework conditions.

However, it is the need for the neurodiverse/disabled student to mould
the demonstration of their learning into a format, which is inaccessible to
them, that requires the development and use of study skills. Principal to
this is the hegemony of the written word as the recognised method of
testing a student’s knowledge. Very often, components of a course only
have one assessment option from which a student can choose (i.e. an
exam, a test or an essay). Yet the need to concentrate the assessment of
an individual’s development through these methods could be
circumvented by the provision of accessible options of equal academic
validity within a course's structure, i.e. a number of different assessment methodologies to which all students could have access, or a methodology which is designed with inclusive practice at its core. Once again, the support services provide a method of enabling a student to have access to their course, but they do so by focusing the change on the student, rather than the environment which is disabling them. Barton (2003) comments that higher education still faces these challenges, and that emphasis should be on cultural change allowing different opportunities for assessment; Waterfield et al (2008) comment extensively on the need for inclusive rather than separate assessment practice, which meets students' expectations as well as academic standards.

It is impossible to comment on the role of the disability service provider as a procurer, without looking in depth as the process underpinning the DSA. The non-medical helper component of the DSA underpins the significant proportion of costs of running many disability services. But the DSA (as the means of funding support services) is itself a paradox. The DSA process requires students to engage with a system in which at each stage (from application to award), the student voice becomes one further step removed from the decision-making process. Each of these stages is demarcated by the need to check and prove the student’s need for support, through the provision of evidence or acceptable reports. Let us look more closely at these various stages:

The most expert voice is that of the student themselves. Many students have a clear idea and understanding of the way that their neurodiversity affects them. The student identifying that they have a need and requesting support is thus the first stage of the process.

The next stage of the process requires the student to interact with an assessor. The assessor can often act as a helpful guide or facilitator, to suggest to students strategies and support that they might not have been aware of. But in doing so, the process also adds a layer of justification and investigation, through which support and adjustments must be verified by a person who is not the student. Critical to this is the provision of evidence, which cannot come from the student's testimony alone, as it must be an external person who verifies the needs of the student. Therefore, whilst on the one hand, the assessment process acts as a mechanism by which a student can access advice and support, it also takes them one stage away from their voice being the most legitimate source of information.

The next stage of the process requires the funding body's administrator or officer to make a judgement about the evidence they have been presented with, both from the professional, who acts in the role as diagnostician and from the assessment report itself. Once again, the distance is increased between the student's voice and the capacity for them to legitimise their own requirements. The need remains for this
information to be judged and verified by an external person. Very often, the administrator or officer at the end of the process is the least expert of all. They have not met the student, they are not a disability specialist and they are working under pressure to make judgements about a number of similar reports. Therefore, the final outcome of the process to determine the nature and level of support which a university might provide, has been ultimately decided by a person, who has never had any contact with the student.

Thus the contradiction remains: the disability service provider, who has helped the student through the process of obtaining a Disabled Students’ Allowance, may well have assisted that person in obtaining the support and equipment they need to access their course. But in doing so, the student has faced multiple levels of interrogation and judgements about their needs, and the institution itself has not made any additional expenditure to support that student. The process has focused on the defects of the student, rather than barriers that the institution erects. Although the process of assessment, the input of the disability service provider and the voice of the student may have identified the needs they have, ultimately it is the student who is being asked to pay for this support (from their own DSA), thus paying for the right to equality to which they are legally entitled.

The Advocate/Activist

Very often, disability service providers act as campaigners and voices for disabled students within their institutions, adopting the identity of the Advocate or Activist. They are endowed with the formal recognition of representing the interests of this group, but this might also be a role that they take on for themselves, in order to challenge and question the practice of others with whom they work. Part of this role requires a service to remove the stigma, prejudice and lack of knowledge, which sometimes surrounds disability, to ensure an equality of inclusion. For example, providing support services to students with mental well-being issues often requires the service provider directly to challenge and demystify commonly held prejudices and fear about mental matters.

Yet in being given or adopting the role of a separate agency, through which the interests of disabled people are represented, the disability service provider encounters a paradox. This model of a separate agency inadvertently perpetuates the division between disabled and non-disabled students. I recall very vividly from my schooldays that those of us who had additional learning needs were required to leave our peers and go to a special location for additional support. This was often referred to as the “special needs hut”. This served as a very visible and often painful reminder of the perceived difference between those of us who experience neurodiversity and our peers, who were by clear implication considered to be ‘normal’. As we develop larger and increasingly sophisticated disability
services, which cater for the needs of a wider, more complex student body, there is a danger that we re-create the equivalent of the “special needs hut” within a university. As a separate service, it perpetuates the division between the neurodiverse/disabled and the neurotypical in the meta-psyche. Further complexity is added, because there are many occasions on which specialist knowledge or strategies are in fact required, to ensure inclusion and equality of opportunity.

**The Adjudicator/Verifier**

Many policies and procedures, through which a student can claim additional support and adjustments, rely on the provision of external evidence from an accredited professional. Such professionals include medical doctors, educational psychologists and psychiatrists. In this respect, the disability service becomes the agency through which this information is received, processed and judged and also through which the nature of support that should be provided is decided.

Examples of this are the examinations policies and procedures, which many institutions have for disabled students. In order to obtain adjustments or special assessment arrangements, students have to approach the disability service to verify and legitimise their needs. In this respect, the service provider, in attempting to ensure the student has access to their chosen course, also perpetuates a system in which the voice of the disabled student is diminished, unless substantiated by an external source. The process requires disabled students to go almost cap-in-hand to request these special concessions.

However, the barriers which a student faces are not simply inherent to the individual. Many of the barriers, which neurodiverse students face in completing modes of study, are imposed by the rigidity and dogmatic nature of the learning, teaching and assessment methodology they have to adhere to. But by employing special and separate policies and procedures for the assessment of disabled students, institutions remove from themselves the obligation to critically appraise academia and make their practice inclusive.

A paradoxical aspect of providing disability services is that many of the strategies and adjustments, that can be organised as a ‘special arrangement’ for a neurodiverse student, would also be good practice for all students. It is important for a disability service to bear this in mind. If one is effectively to challenge and remove the barriers to truly inclusive practice, the most apt strategy would be to ensure that the special arrangements (commonly used only for disabled students) are in fact available to all students. Not only does this remove the responsibility from the student having to request support through lengthy and often suspicious procedures, it includes these options as part of the mainstream and academically validated structure of a programme.
Conclusion

The roles I have outlined above do not include all the identities that a disability service provider can adopt, but they do highlight what I feel are the core challenges that most services face. Firstly, we can see that the policies, procedures and systems, which these services work through, are often at odds with promoting inclusion and maintaining the student’s voice at the core of the educational experience. Systems like the DSA are interrogative and rely on multiple layers of investigation before support is offered. Exam polices and procedures, which rely on special arrangements based around the individual, (rather than addressing the core barriers posed by learning and teaching methodologies) do not properly address inclusivity, nor do they ask the neurotypical world to modify itself to include the neurodiverse/disabled.

It is also paradoxical when you consider the picture from the student perspective. Disabled students are disadvantaged by the multiple layers of policy, procedure and system which they must navigate through in order to achieve parity with a peer without an impairment. Their route to achievement is blocked not only by the barriers of the institution, but also by the policies and procedures which attempt to address issues of equality. Given the nature of many neurodiverse thinkers (e.g. Asperger’s or dyslexia), being required to follow such a route to achieve equality can be an uncomfortable and even traumatic and confusing experience. For the service provider, who is often located at the centre of these polices, this presents a difficult paradox. They are the key agents who perpetuate this source of division and additional burden, but this is the only route they have open to them ensure the neurodiverse/disabled student receives a form of equality of opportunity.

Another layer of complexity is added for the service providers themselves. The roles and identities which they are asked to adopt are often at odds with each other. For example: the Adjudicator/Verifier contrasts with the role of the Activist/Advocate. Each time an individual’s needs are interrogated and assessed, this weakens the position of a service that is requiring institutional change to remove barriers, because that focus remains on the individual.

This paradox also continues with the perception of disability service providers by their own institutions. Being given named responsibility for services for disabled students inculcates an expectation in colleagues within an institution that this service will take responsibility for all aspects of the students’ needs. When the same service then asks others to modify their own practice, (such as the academic who is asked to modify or invent new assessment methodologies) this can create a tension and confusion.
Taking all of these factors into account, and given that disability service providers may well play a paradoxical role in both promoting and preventing inclusive practice, what can a disability service do to address these issues? Is it possible for a disability service provider to adopt a clear and coherent identity which responds to the needs of all the key stakeholders and still promote inclusion and an understanding of neurodiversity?

It is certainly not feasible or realistic to assume or to even suggest that disability services should be removed from educational institutions. In fact, these services will always have a role to play in providing a hub of expertise on which colleagues can draw to assist them in addressing issues of accessibility and inclusion. But the challenge of inclusion and removing barriers for disabled students must be addressed at an institutional level, in all aspects of mainstream planning. Developing inclusive methodologies for learning, teaching and assessment lessens the need for complicated, time-consuming and interrogative procedures for special arrangements, and opens up academically valid routes for all students to choose from. Providing resources, which support inclusive practice directly at the institutional level, lessens the need for students and disability service providers to rely on the contradictory and intrusive DSA process. At the same time, these kinds of development can help ensure that the expertise in a disability service can be channelled into consultative and developmental work, rather than creating a separation between disabled and non-disabled students. Central to all of these activities must be the student voice, allowing direct input from the neurodiverse in specifying priorities, identifying barriers and working with their institutions to achieve the goal of inclusion.

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Editorial Guidelines

* Articles should be between 2500 and 6500 words, usually around 3,500 to 4,500. You may be asked to reduce the number of words even if your article is less than 6500, if the referees feel that you could express yourself more succinctly. Communication on your submission will be via the NADP office.

* An abstract of no more than 300 words is required for research based articles (not for reflective pieces about personal experiences—which will mainly be from disabled/neurodiverse people).

* Contributions from disabled/neurodiverse people about their own experiences of post 14 education and training (in its broadest sense) are very welcome.

* Harvard referencing is required and at least 50% of your references need to be no more than three years old.

* Contributions should reflect ethical participatory/emancipatory Research, which involves disabled/neurodiverse participants and results in interventions which improve services for disabled/neurodiverse people in the post 14 (education and training) sector.

* Ethical guidelines prescribe that research participants should not be identifiable, and confidentiality must be respected.

* Language reflecting the social model of disability is expected.

* Articles must be original and should not be being considered by another journal when they are presented.

* Formats must be accessible to screen reading software.

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