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Equity or Advantage? The effect of receiving access arrangements in university exams on Humanities students with Specific Learning Difficulties (SpLD)

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Abstract This research aimed to identify whether the granting of exam access arrangements to students with Specific Learning Difficulties (SpLD) creates exam equity with their typically developing (TD) peers or confers an advantage. Empirical data was collected from the exam scripts of 67 Humanities students with SpLD who were permitted the use of a word processor and/or 25% extra time and 70 TD peers who took the same exam under standard conditions. The length of answers on the exam scripts, marks and degree classification achieved by students with SpLD were compared with those of their TD peers. The statistical conclusion of this study is that the students with SpLD who were granted exam access arrangements did not perform differently compared to their TD peers who took the same exam under standard conditions. This demonstrates that exam access arrangement do not confer an advantage for SpLD students in Humanities.

Key words specific learning difficulties; exams; exam access arrangements; extra time; word-processor

Introduction

Formal, timed, written, closed book examinations remain a common method of educational assessment that many UK Universities employ to gauge a student's level of subject based knowledge, ability and skills following a course of study (Singleton,1999). This is based on the assumption that a student's performance in an exam acts as an objective and reliable measure of that student's learning and proficiency in the particular subject area studied (Morrison, et al. 2004). This assumption, however, is controversial. Knight (2002), for example, argues that the lack of rigorous and continuous training of examiners in Higher Education in the UK, coupled

with the difficulties inherent in reliably marking essay type exam responses (especially in Arts and Humanities subjects) and the impact that examination technique itself (rather than subject knowledge and skills) may have on outcomes leads to inconsistencies within the marking process, doubts about the reliability of exam grading and mistrust of the claim that the results achieved in an examination are representative of the candidate's skills in his or her subject .

Despite this debate surrounding the reliability and validity of examinations, the convention of measuring academic achievement through formal, timed, written, closed book examinations persists in many Higher Education Institutions in the UK. Given the controversy over the reliability and robustness of summative assessment, together with the high-stakes nature of University exams, it is imperative that these exams offer a fair evaluation of each candidate's exam performance in a way that is equitable to all candidates. This applies as much to the conditions under which the exam is conducted as the marking rubric used to gauge exam performance. Ensuring that exams are equitable to all students in the UK offers particular challenges for assessment designers. Diverse groups, including candidates with specific learning difficulties (SpLD[1]), are likely to be proportionately represented in any exam cohort and it is commonly posited that standard exam conditions place students with SpLD at risk of being unfairly disadvantaged (e.g. Waterfield and West, 2006). In order to redress any potential inequality inherent in assessment practices that may discriminate against students with SpLD, a policy of implementing adjustments to the conditions under which an exam is conducted is generally adopted in the UK (Waterfield and West, 2006; Singleton, 1999). This approach is in line with UK Universities' statutory duty under the Equality Act (2010) (Legislation.gov.uk. 2010) to make assessments more accessible to students with SpLD.

Access arrangements, such as additional time and the use of a word processor, are the most frequent adjustments that students with SpLD receive in a time constrained exam situation (Lovett, 2010; Jones, 2014). In the UK, 25% is the usual amount of extra time granted, with over 97% of all candidates who were awarded extra time in GCSE and A levels[2] receiving this amount (Ofqual, 2915). It should be borne in mind that the principle of granting a standard amount of extra time, rather than determining a 'tailor made' time extension calculated in an individualised manner (based on the needs of the individual and the demands of the assessment), presupposes a degree of homogeneity across all students with SpLD. That is to say, this accepted practice of 'one size fits all' infers that most students with SpLD lack any material variation in their needs in the context of exams. However, rather than representing a homogenous group, the impact of having an SpLD (including the impact on exam performance) can vary across a spectrum (Reid, 2009; Manis & Bailey, 2008). Rapcsak et al (2009), for example, argue that the severity of the impact on study of the student's SpLD broadly

correlates with the underlying continuum of cognitive impairment (with each profile and manifestation being individual). However, these variations between students with SpLD (which may warrant differing amounts of additional time in exams) are not reflected in the amount of extra time granted to each individual student. At the same time, a lack of empirical evidence exists that justifies the calculation of 25% extra time specifically (as opposed to an alternative percentage of extra time). It appears that this determination is based on practical considerations (i.e. the administrative convenience of conducting the exam within available resources) rather than a distinct SpLD evidence based calculation (Singleton, 1999). Thus the convention of granting 25% extra time to the majority of students with SpLD (regardless of their individual variations in cognitive profiles or study-based needs) appears to be an administrative imperative that has become accepted practice, rather than one informed by evidence or theory.

Nonetheless, the granting of a uniform amount of extra time (generally 25%) remains common practice in the UK for students with SpLD. The practice of granting of extra time (rather than other types of exam adjustments) to this cohort is based on the assumption that students with a diagnosis of SpLD share common deficits in the way in which information is processed, stored and retrieved (British Dyslexia Association, 2015; Reid, 2009) and are likely to demonstrate a cognitive profile that includes poor speed of information processing and deficits in working memory (Wechsler, 2008; Grant, 2009). It is these information processing impairments, which represent core characteristics of SpLD, that can prevent these students from demonstrating their full potential when sitting exams under standard time conditions (Singleton, 1999). In other words, the impaired processing speed and working memory deficits that are characteristic of SpLD may render these students unable to complete the task in the designated time (as candidates with SpLD are slower in articulating their subject knowledge (McKimm, 2012; Licari et al, 2015)) and thereby disadvantage this group in examination situations by comparison to their typically developing (TD) peers (Reid, 2009). Access arrangements are therefore granted with the purpose of compensating for this inequality in the context of a formal, timed, written examination and aim to place students with SpLD on a level playing field with their TD peers so that they can demonstrate their knowledge in the exam, rather than their disability (Singleton,1999).

However, the granting of exam access adjustments, such as additional time and the use of a word processor, is contentious (Zuriff, 2000). Critics of the practice argue that, rather than acting as a mechanism for fair treatment of students with SpLD, the granting of additional time, especially in conjunction with the use of a word processor, confers an unfair advantage and compromises the comparability of exam results across the student cohort (Elliott & Marquart, 2004). This pivots on the assumption that all students achieve better grades if they are permitted additional time in exams. That is

to say, additional time enables all students to produce better quality responses by more fully addressing the question, including a greater wealth of detail and, depending upon the type of exam, complete more of the questions on the paper (Zuriff, 2000; Bolt, 2004). It is also posited that, for those students who are able to word process at a fast rate (i.e. faster than normal handwriting speed), permission to use a word processor in addition to extra time in exams confers a further 'time gain' (Mogey et al, 2007). Given these views, some academic staff in University settings are concerned that, rather than achieving parity with their peers, students with SpLD who are granted additional time in exams, as well as those using a word processor, are gaining an advantage over their TD peers, which undermines the robustness and 'fairness' of the exam process (Lovett, 2010).

Given this tension and the current lack of evidence, the aim of this study was to investigate whether the granting of exam access arrangements (specifically the use of a word processor and/or 25% extra time) to students with SpLD creates equity or confers an advantage. To our knowledge, this is the first study that has explored whether University students with SpLD who are granted exam access arrangements produce significantly more words in an exam and / or achieve higher marks than their TD peers. The comparison between the number of words produced and the quality of exam performance (as indicated by exam grade) also enables the relationship between these to be determined. It was hypothesised that the length of answers and results achieved for students with SpLD who are granted exam access arrangements (either additional time or additional time and the use of a word processor) will differ significantly from their TD peers who have taken the same exam under standard conditions.

Methods

Participants

A total of 137 participants were recruited for this study, comprising of 67 participants with SpLD and 70 TD participants. Post-hoc power calculations suggested that a sample size of 137 should provide 82% power to reject the null hypothesis (alpha =.05, two-tailed). The overall sample group of 137 participants were categorised into the following 3 sub-groups: 31 participants who disclosed a diagnosis of SpLD and were granted 25% extra time; 36 participants who disclosed a diagnosis of SpLD and were granted 25% extra time plus the use of a word-processor and 70 participants who did not disclose a disability or SpLD and who took the same exam under standard conditions.

When selecting participants for the SpLD groups only those candidates who had been formally diagnosed with SpLD (and held a diagnostic assessment report that met national guidelines relating to SpLD assessment[3]) were included in the study. For the purposes of this study, students with any one of the following diagnoses were included:

- dyslexia
- dyspraxia
- dysgraphia
- specific learning difficulty

This inclusion criterion for SpLD participants was based on the view that deficits in working memory and impaired processing speed are common characteristics across the range of SpLDs (British Dyslexia Association, 2015) and it is these characteristics that affect exam performance under timed conditions and warrant exam adjustments. Therefore this study has included participants with a formal diagnosis of any one of the SpLDs (rather than limiting to one discrete sub-group of SpLDs, such as dyslexia) as the central concern of this research relates to the appropriateness of exam adjustments which aim to compensate for deficits in working memory and processing speed.

Participants included first, second and third year undergraduate students who were drawn from the Faculties of English, History and Law. These Faculties were selected as their exam papers required essay style responses to 4 questions (which candidates chose from a list of alternatives) and the standard time allowed for these exams was 3 hours. The SpLD participants were matched with an index group of TD students of similar numbers of candidates on the basis of exam paper characteristics alone. Specifically, the paper of a participant with SpLD was matched with a randomly selected paper from a TD participant who sat the same examination question paper under standard exam conditions (i.e. candidates studying the same course and in the same year of study). Due to participant anonymity, no other participant characteristics were taken into account. As a result, this study was unable to take into account the potential impact on the dependent variables (marks, classification) of the unknown mix of sample group characteristics. Gipps & Murphy (1994) argue that gender, race and social factors (including previous educational experience) can affect exam performance, while Durkin & Main (2002) further posit that study skills tuition may also boost exam results for students in HE. However, to protect the anonymity of the participants in this study, exam scripts were identified by candidate number only. Thus it was not possible to identify which (if any) of the students had received study skills tuition or had previous experience in the use of access arrangements. In addition, information relating to age, gender, ethnicity, socio-economic background and previous educational experience of participants was unavailable (due to anonymity) and it was therefore not possible to take these variables into account when making comparisons or to analyse any effect that these variables may have had on exam performance.

The breakdown of participants between the three faculties is shown in Table 1 overleaf. The study was approved by the ethics committee at of the University of South Wales.

Table 1: Breakdown of participants by Faculty

Faculty	Number of SpLD students with 25% extra time	Number of SpLD students with 25% extra time & use of word processor	Number of TD students with standard conditions	Total
English	11	9	22	42
History	15	11	27	53
Law	5	16	21	42
Total	31	36	70	137

Procedure

All exam papers were drawn from the 2014 summer examination period. The word count, mean number of words per minute, marks achieved, and distribution of classifications on the papers of the participants with SpLD were compared to those of the TD participants who sat the same exams under standard conditions to see if there were any statistically significant differences. The method used for counting words on each exam script followed the protocol set out by the Detailed Assessment of Handwriting (DASH 17+; Barnett et al, 2010). To check reliability, an independent research assistant verified the raw data by second counting a random sample of 18 exam scripts.

Data Analysis

A multi-factor analysis of variance (ANOVA) was used to compare differences between the groups [SpLD with 25% extra time; SpLD with 25% extra time and a word processor; TD]. In order to determine whether the

SpLD group who were granted the use of a word processor and/or 25% extra time demonstrated an advantage, the following comparisons were made between the exam scripts of candidates with SpLD and those of TD candidates: Length of answers on the exam script (as determined by individual word count); Mean number of words per minute produced and Exam marks and degree classification achieved. Degree classifications are categorised into the following levels of achievement: First class (1st) (marks above 70%); Upper Second Class (2:1) (marks between 60-69%); Lower Second Class (2:2) (marks between 50-59%) and Third Class (3rd) (marks between 40-49%). In addition, the length of the exam papers (as determined by overall word count) for both groups were compared with the mark and classification the papers received in order to investigate any correlation between length of answer and grade.

Results

Comparison of word count on scripts

The mean word count on exam scripts produced by the participants with SpLD and the TD participants were compared using a multi-factor analysis of variance (ANOVA). This comparison aimed to determine if the candidates with SpLD who were granted exam access arrangements produced longer exam scripts (and so demonstrate a word count advantage) in comparison with their TD peers who sat the same exam under standard conditions. The total word count on the scripts of students with SpLD represents the total number of words produced by these students when permitted 25% additional time to answer. By including the scripts of students with SpLD who took the exam using a word processor as well as 25% extra time, the analysis of total word count should also show if the use of a word processor results in longer answers than those produced by the index group and / or the SpLD participants who produced handwritten scripts. A breakdown of the total (mean) word counts for all participants is shown in Figure 1 below:

Figure 1: Comparison of word count (mean) on scripts across all participant groups
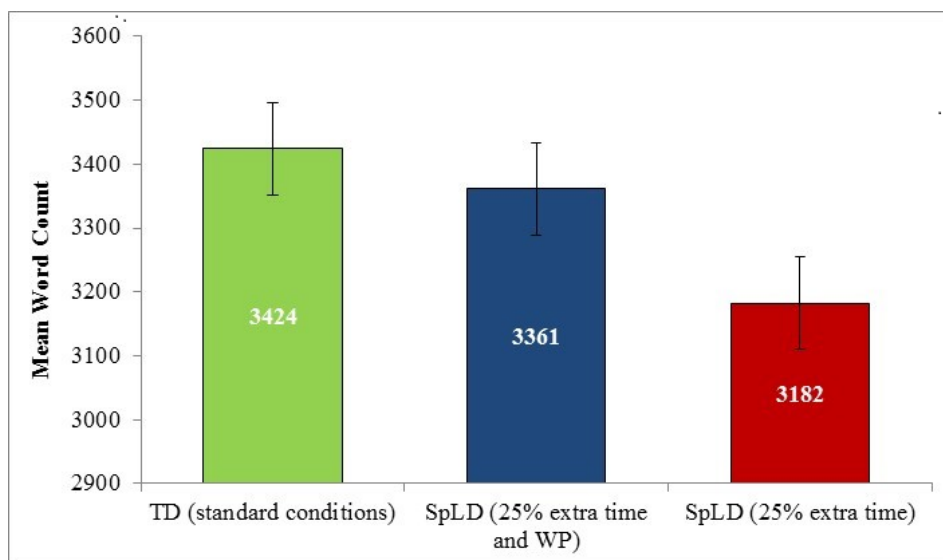
As this data shows, the mean word count for the group with SpLD (3,182) was lower than the mean word count for the TD candidates who took the same exam under standard exam conditions (3,424). A one-way ANOVA [Group, Word Count] confirmed that this difference in word count was non-significant ($F(1,136) = .783$, $p = .378$).

The candidates with SpLD who were permitted the use of a word processor in addition to 25% extra time produced a higher mean word count (3,361) than the candidates with SpLD who were allowed 25% extra only (3,182), although a one-way ANOVA showed the difference between these two groups was non-significant. However, the TD candidates produced the highest word count of all of the sample groups (3,424). While a one-way ANOVA [Group, Word Count] showed that the difference in word count between the TD candidates and the candidates with SpLD who were granted 25% extra time is not significant ($F(1,100) = 3.171$, $p = .078$), the *p*-value suggests some difference between the variances in the population.

The comparisons between the mean word count of all of the SpLD (combined SpLD candidates who sat exams with 25% additional time and the use of a word processor and SpLD candidates who sat exams with 25% additional time) and TD participants were broken down into faculty areas. In order to ascertain if differences exist between subjects a one-way ANOVA [English, History, Law and word count] was conducted. A significant difference was found between subjects and word count ($F(2,69) = 5.81$, $p = .005$), with English candidates producing the shortest papers and Law candidates producing the longest papers (both SpLD and TD candidates alike).

Comparison of words per minute on scripts

While the analysis of the total word count data above aimed to show any effect of the additional time on the length of the scripts, it is useful to determine if the students with SpLD write or process their ideas more slowly in exams than their TD peers. A comparison of the mean number of words per minute produced by each participant should ascertain whether or not the data suggests that candidates with SpLD demonstrate slower writing speeds in exam situations than their TD peers. A breakdown of mean words per minute for all participants is shown in Figure 2 below:

Figure 2: Comparison of words per minute (mean) on scripts across all participant groups
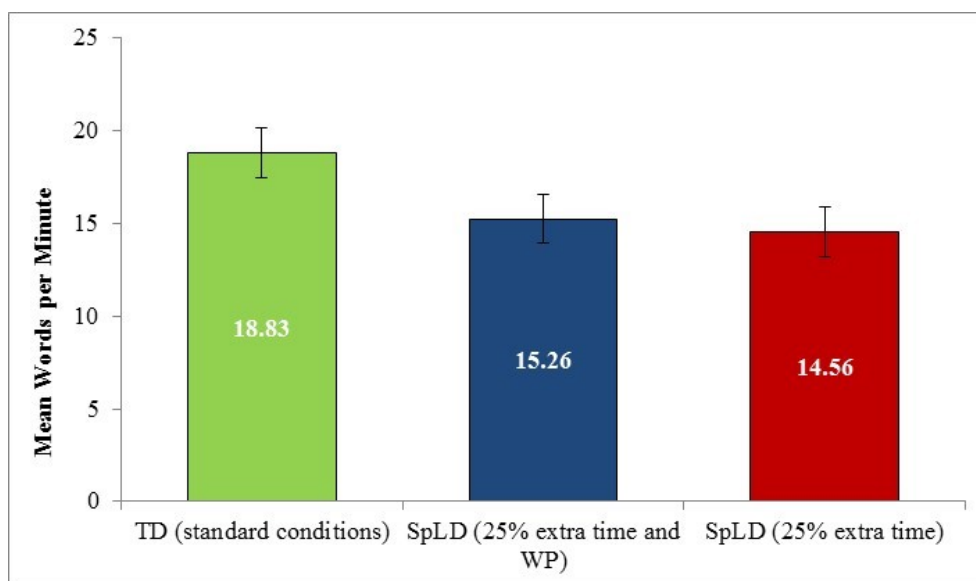
As this data shows, the mean number of words per minute produced by the group with SpLD came to 14.56 for handwritten scripts and 15.26 for word processed scripts, resulting in a total mean number of words per minute of 14.63 for all 67 candidates with SpLD who were granted the use of a word processor and/or 25% extra time. This was lower than the mean word per minute count for all 70 TD candidates who took the same exam under standard exam conditions; with the TD sample group achieving an average word per minute count of 18.83. A one-way ANOVA [Group, Words per Minute] confirmed that this difference was significant ($F(1,136) = 5.060$, $p = .026$). A comparison of words per minute between the TD and SpLD group who were granted 25% extra time and produced a handwritten script revealed a significant main effect of group for words per minute ($F(1,100) = 23.12$. $p < .001$) with TD students producing significantly more words per minute than SpLD students with 25% extra time.

It is worth noting that the candidates with SpLD who were permitted the use of a word processor in addition to 25% extra time produced more words per minute (15.26) than the candidates with SpLD who were allowed 25%

extra and wrote the script by hand (14.56). However, a one-way ANOVA showed that this difference was non-significant ($F(1,66) = 1.090$, $p = .30$).

Comparison of mean marks

If the data supported the commonly held view that the use of a word processor and/or 25% extra time advantages students with SpLD by comparison to their TD peers, then it would be expected that the students with SpLD who were granted these exam arrangements will achieve higher marks than their TD peers taking the same papers under standard conditions.

In order to evaluate this belief, the mean marks of all participants were compared using a multi-factor analysis of variance (ANOVA). A breakdown of the mean marks is shown in Figure 3 below:

Figure 3: Comparison of marks (mean) between all participant groups
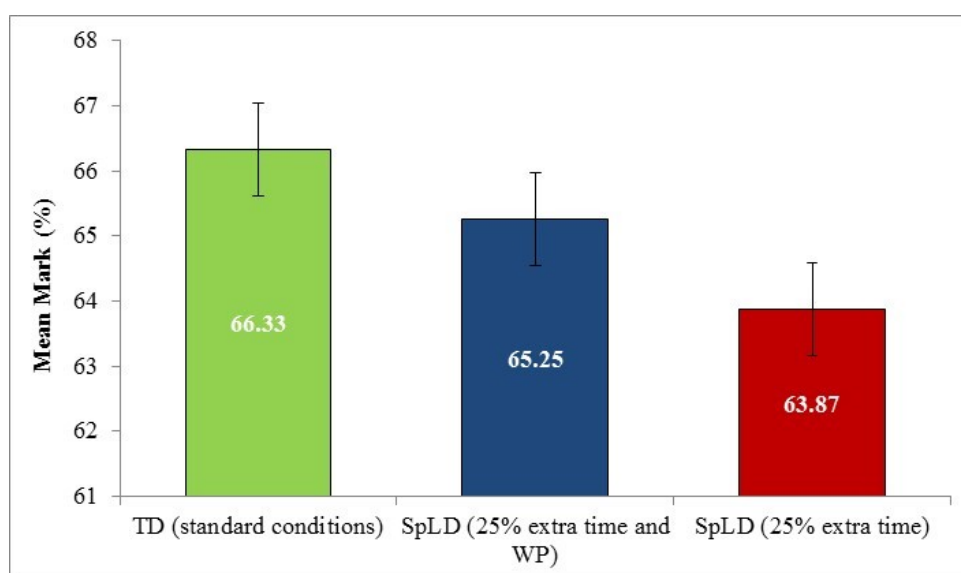

Taking the sample groups as a whole, the mean marks achieved by the TD participants who sat the exam under standard conditions (66.33) are higher than the mean marks achieved by the participants with SpLD who sat the same exam with the use of word processor and/or 25% extra time (64.56). A one-way ANOVA [Group, Mark] confirmed that the difference in mean marks achieved by the TD participants and the participants with SpLD who produced handwritten scripts show a significant main effect for mark ($F(1,100) = 5.39$, $p = .022$) with TD students obtaining a significantly higher mark than the students with SpLD who had 25% extra time and wrote by hand. However, no significant differences in mark existed between the TD participants and the participants with SpLD who were granted the use of a word processor with 25% extra time.

Comparison of exam script classification

When the marks are categorised into classifications the results show that TD candidates achieve higher classifications than the participants with SpLD. Overall, 22% of TD candidates achieved the highest classification (first class) compared with 19% of the candidates with SpLD, while 74% of the TD candidates achieved a 2:1 classification by comparison with 64% of the candidates with SpLD. At the lower grade levels this pattern is reversed, with 12% of the candidates with SpLD achieving a 2:2 classification by comparison with 4% of their TD comparators, while 4% of the candidates with SpLD achieved a 3rd class classification whereas no TD candidates received this grade. A breakdown of the classifications by group is shown in Figure 4 below:

Figure 4: Comparison of paper classification (mean) between all participant groups
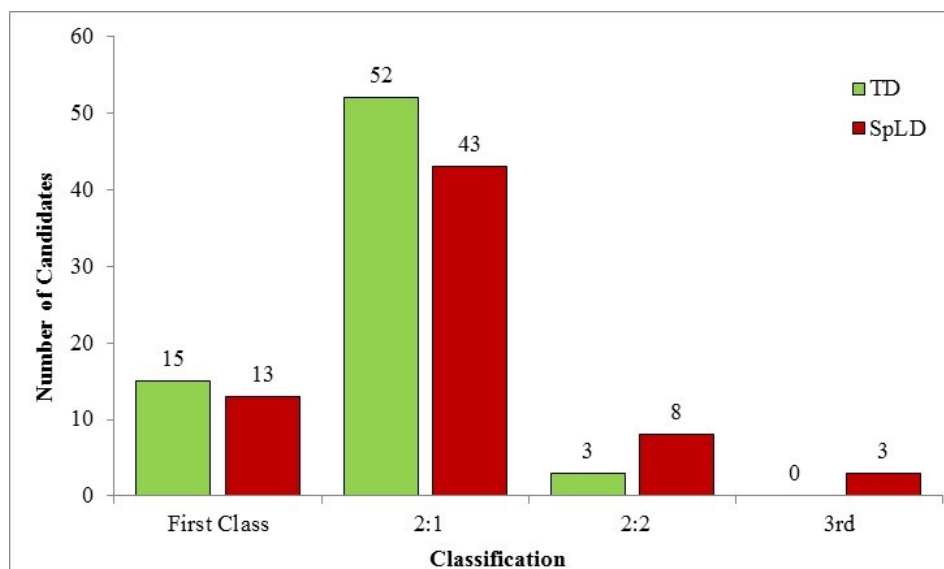
The data from this study shows that the TD candidates who sat the exam under standard conditions are achieving on average higher classifications than the candidates with SpLD who sat the same exam using a word processor and/or 25% extra time. For students with SpLD who used a word processor with 25% extra time, these differences were not significant. However, a comparison of the marks for students who were granted 25% extra time (i.e. producing a handwritten script) with the marks of the TD students revealed a significant main effect for mark ($F(1,100) = 5.39$, $p = .022$) with TD students obtaining a significantly higher mark than SpLD students who had 25% extra time.

Comparison between mark and word count

The view that additional time, especially when used in conjunction with a word processor, advantages students with SpLD pivots on the assumption that

the additional time enables the student to produce longer answers, which in turn, correlates with higher marks. In order for the data to support this view, the evidence should suggest that length of answers (as measured by the number of words on the script) will correlate closely with marks (i.e. long answers should result in high marks and shorter answers should result in low marks). In order to investigate this, the mean number of words on the scripts were compared with the grade of the script to ascertain if a higher number of words resulted in higher marks and if shorter answers correlated with lower marks. A comparison between the mean number of words per paper and the classification achieved is shown in Table 2 below:

Table 2: Breakdown of the word count compared to classification

	Classification			
	1st	**2:1**	**2:2**	**3rd**
Mean word count per paper for candidates with SpLD & 25%Extra time	2939	3097	3192	3027
Mean word count per paper for candidates with SpLD, word processor & 25% extra time	3046	3281	3865	3487
Mean word count per paper for TD candidates under standard time conditions	3109	3499	3928	0

A Pearson product-moment correlation coefficient was computed for TD students without access arrangements to assess the relationship between the number of words on a script and the mark achieved and a non-significant relationship was found ($r_p = .052$, n = 70, $p = .67$). This weak negative correlation between word count and mark for TD students suggests that shorter scripts achieve higher marks than longer scripts. One explanation for this may be that students who spend more of the exam time planning and thinking critically about their responses in order to produce a well-structured, fluent, concise argument that clearly addresses the question (and so demonstrate understanding of the study material) tend to achieve better outcomes than those who aim to reproduce as much information as possible in the time available (i.e. the examiners are looking for quality not quantity) (Minbashian, Huon & Bird, 2004). Although the data fails to show any correlation between longer answers and increased marks for the student group as a whole, a positive relationship was observed between the number of words on a script and the mark achieved for SpLD students with access arrangements (albeit a weak correlation ($r_p = .306$, n = 67, $p = .012$)).

Discussion

Overall, the outcomes of this study show that students with SpLD who are granted the use of a word processor and/or 25% extra time in their exams fail to produce a higher word count or achieve higher marks than their TD peers who take the same exam under standard conditions. In fact the opposite is the case, with TD participants producing higher word counts and achieving higher marks, on average, than candidates with SpLD. This is consistent with the research of Wadley & Liljequist (2013) who found that SpLD students who were granted additional time underperformed relative to their TD peers who took the same test under standard conditions.

Although no overall significant differences were found when comparing the mean number of words between TD and SpLD candidates who were granted 25% extra time and SpLD candidates who were granted 25% extra time and the use of a word processor, the data indicates that the SpLD candidates using a word processor with extra time or handwriting with extra time produced shorter exam scripts than TD candidates taking the same exam under standard conditions. This is consistent with the findings of Wadley & Liljequist (2013), who found that students with SpLD 'took more time to complete the test' (p.266) than their TD peers, and that the granting of additional time had the effect of reducing the gap between the output of SpLD and TD candidates (Wadley & Liljequist, 2013).

The mean number of words per minute produced by the group with SpLD was significantly lower than the mean number of words per minute produced by the TD candidates who took the same exam under standard exam conditions. This indicates that the SpLD candidates (with and without a word processor) produce significantly fewer words per minute than TD candidates taking the same exam under standard conditions. This outcome supports the findings of the research of Reid (2009), McKimm (2012), Kibby et al (2008) and Finn et al (2014), which suggests that individuals with SpLD process information more slowly than their TD counterparts. For those candidates with SpLD who produced a handwritten script, this outcome also supports the findings of the DASH-17+ (Barnett et al, 2010), which compared the free writing performance of the students with dyslexia with age-matched participants without dyslexia and found statistical differences with the students with dyslexia writing more slowly than their age matched counterparts (Barnett et al, 2010).

In addition, contrary to the commonly held view that students using a word processor are able to produce more words in the time allocated (based on the premise that students can type faster than they are able to write e.g. Lam & Pennington, 1995), this data shows that SpLD students who use a word processor in the exam produce significantly fewer words per minute than their TD peers who wrote their script by hand. These findings corroborate the

hypothesis that students with SpLD process information more slowly than their TD peers (Reid, 2009; McKimm, 2012; Kibby et al, 2008; Finn et al, 2014) and supports the rationale for granting extra time to this cohort as a means of compensating for any disadvantage that results from this core feature of the disability (Singleton, 1999; Pollak, 2009).

Although those students with SpLD who were granted the use of a word processor and 25% extra time produced more words per minute and achieved higher marks than the students with SpLD who were granted 25% extra time and who wrote their scripts by hand, these differences were not significant. Nonetheless, the data suggests that the combination of the use of a word processor with 25% extra time more closely levels the playing field than 25% extra time alone. This finding is consistent with the research of Lam & Pennington (1995) and suggests that the use of a word processor may reduce certain barriers that candidates with SpLD experience when writing under time pressure. These barriers include problems with spelling (Reid, 2009), structure (Grant, 2009; Pollak, 2009), working memory (Gathercole, Packiam-Alloway, Willis & Adams, 2006) and handwriting fluency (Connelly et al, 2005), which may negatively affect exam performance by leaving 'fewer cognitive resources available to the higher order processes needed for composition' (Connelly et al, 2005, p.99). The data from this current study suggests that the use of the word processor is more effective in reducing these barriers than extra time alone. This is further supported by the findings of Lewandowski, Lovett, et al (2008) who suggests that the differences in performance between the SpLD and TD participants were not attributable to differences in cognitive ability, but that individuals with SpLD are disadvantaged by comparison to their TD peers in exam situations (Lewandowski, Lovett, et al, 2008), further supporting the granting of the use of a word processor in addition to the awarding of 25% extra time, rather than by extra time alone.

Finally, the outcomes of this study suggest no significant correlation between word count and mark/degree classification across the participants as a whole, with higher word counts failing to correlate with higher marks and low word counts failing to correlate with low marks. Although no significant correlation was observed between word count and mark/degree classification across the participants as a whole, a weak positive relationship was observed between the number of words on a script and the mark achieved for the group of students with SpLD who were granted access arrangements. There are two possible explanations that could account for this observation. Firstly, a positive relationship between word count and mark for SpLD candidates could suggest that the participants with SpLD failed to achieve the ceiling of their knowledge, even with access arrangements[4]. Alternatively, this relationship between mark and word count for participants with SpLD could be accounted for by the effect that the use of the word processor has on 'releasing' resources for higher order cognitive processes (Connelly et al,

2005; Lam & Pennington, 1995) rather than the increased word count per se. That is to say, it could be argued that the increase in word count is simply a 'by-product' of using the word processor, while it is the impact that the use of the word processor has on exam access skills (rather than the increase in word count itself) that materially affects the marks achieved.

Given that the SpLD participants produced fewer words overall per script (on average) than their TD peers, this outcome is consistent with the research of Runyan (1991) into the maximum potential thesis (MPT). MPT states that only students who process information more slowly due to SpLD are assisted by additional time as their TD peers are already achieving their maximum potential under standard time conditions. In the current research, the data shows that the TD students did not increase performance with longer answers, suggesting that TD participants are already achieving their maximum potential or 'ceiling of knowledge' under standard time conditions. However, the performance of the students with SpLD improved with longer answers, reducing, but not fully closing, the gap in performance between SpLD and TD candidates (suggesting that SpLD candidates are still not achieving their maximum potential or 'ceiling of knowledge' despite extended time conditions). It could also be argued that this finding further supports the argument that the use of a word processor, in addition to 25% extra time, creates greater parity between SpLD and TD candidates in the exam than 25% extra time alone. As the use of the word processor in this study resulted (on average) in longer exam scripts than the granting of extra time alone, the positive correlation between word count and mark observed for students with SpLD may, arguably, be a reflection of improved performance resulting from the use of the word processor, rather than from the longer answers per se. This is based on the argument that the use of the word processor improves performance for SpLD participants as it ameliorates poor access skills (i.e. offsets problems with spelling, working memory, organisation and writing fluency). This leaves the student with more resources available for the higher cognitive processes required for the composition of the written response (Connelly et al, 2005). In other words, although the use of the word processor results in slightly higher word count, it is not necessarily the increased word count itself that is fully responsible for the improved performance, but, to some degree, the 'releasing' of resources for higher order cognitive processes that the word processor confers. However, it should be noted that although the data shows some correlation between length of answers and marks for the SpLD group, the increased marks for the participants with SpLD did not translate into increased degree classifications.

As no correlation was observed between word count and mark for TD students, extra time (leading to higher word count) is unlikely to significantly improve the performance of students with no identified disability. These findings support the 'accommodation-disability' paradigm of Phillips (1994) that proposed that non-disabled students do not experience barriers accessing

the exam and so do not significantly improve their performance if granted exam access arrangements (Phillips, 1994). This outcome is also consistent with the Maximum Impact Potential theory (Runyan, 1991) and the findings of Elliott & Marquart, 2004, Fuchs & Fuchs (2001) and Huesman & Frisbie (2000) which posit that non-disabled students taking exams under standard conditions demonstrate a 'ceiling effect', as (unlike the students with SpLD) they are able to complete the test in the designated time to their full potential and therefore do not show gains in their scores when permitted additional time.

This is the first study to explore whether SpLD University students who are granted exam access arrangements produce significantly more words in an exam and / or achieve higher marks than their TD peers and the statistical conclusion of the data from this study is that candidates with SpLD who were granted exam access arrangements (use of a word processor and/or 25% extra time) did not perform differently (in terms of total word count, mark and degree classification) than their TD peers who took the same exam under standard conditions. Therefore, the outcomes of this research project suggests that students with SpLD who use a word-processor and/or 25% extra time are not placed at an advantage by comparison to their TD peers who take the same exams under standard exam conditions.

Recommendations

This study has shown that the exam adjustments granted to students with SpLD fail to fully place these students on a level playing field with their peers. This is particularly the case for students who were granted 25% extra time only (i.e. those who did not use a word processor). In the first instance, it would be recommended that students with SpLD are encouraged to use a word processor in exams, wherever possible, and are provided with the necessary support and training to facilitate this. It may also be the case that the students with SpLD who were granted exam accommodations failed to use the access arrangements in a way that created equity (instead, using the extra time to simply produce more words on the script without improving their performance). Therefore, the implementation of study skills tuition aimed at developing exam techniques would be recommended for students with SpLD who are granted exam arrangements. These study skills sessions should assist students with SpLD in developing exam techniques aimed at maximising their use of their exam adjustments in order to enable them to demonstrate their potential.

Given that the awarding of exam arrangements is contentious and identifies a particular group as 'other', alternatives could be considered that may achieve the purpose of ensuring equity for all students without raising concerns about conferring an advantage. One recommendation would be that assessment processes using the principles of Universal Design (Ketterlin-

Geller, 2005) are considered. Universal Design is a framework of inclusive practices, encouraging environments that are flexible enough to accommodate individual differences. In the context of exams, a policy of Universal Design would aim to ensure that exams are designed in a way that is equitable to all candidates, minimizing time constraints, such that separate accommodations are rendered unnecessary as well as providing a range of alternative assessment methods to the formal, timed, exam.

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[1] For the purposes of this study, students with a formal diagnosis of either dyslexia, dyspraxia, dysgraphia or a specific learning difficulty were included

[2] Both GCSEs (General Certificate of Secondary Education) and A levels (General Certificate of Education Advanced Level) are UK, subject based, pre HE examinations. GCSEs are offered as part of compulsory Secondary education and are often a prerequisite for taking A levels. A levels are taken at the post compulsory Secondary education stage and are usually required for University entrance.

[3] National guidelines relating to SpLD referred to were those established by the SpLD Working Group 2005/ DfES guidelines (and subsequent updates)

[4] It should be noted, however, that no relationship was observed between word count and classification for this group

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