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Macdonald, Stephen J and Deacon, Lesley (2019) Twice Upon a Time: Examining the Effect Socio-Economic Status has on the Experiences of Dyslexia. *Dyslexia: An International Journal of Research and Practice*, 25 (1). pp. 3-19. ISSN 1099-0909

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Twice Upon a Time: Examining the Effect Socio-Economic Status has on the Experience of Dyslexia in the UK

Abstract: From the mid-1990s there have been a number of campaigns aimed at raising awareness of dyslexia and social inclusion. In conjunction with these campaigns educational and employment policies have been implemented that advocate inclusive and workplace adjustments for people with dyslexia. This study aims to explore the intersectional relationship between dyslexia and socio-economic status. The findings analyse adult perceptions of education and employment which have been shaped by 23 years of social policies promoting anti-discriminatory practice. The study applies a quantitative approach which collected data from a national survey conducted from 2015 to 2017. The sample consists of 442 adult participants who reported having dyslexia. The social model of disability has been applied in this study to interpret the data findings from a disability studies perspective. The article suggests that socio-economic status significantly affects issues of diagnosis, educational and employment experiences. The findings illustrate an intersectional relationship between socio-economic status and disability inequalities which have an effect on the experiences of people with dyslexia in adulthood.

- The study aims to explore the relationship between dyslexia and socio-economic status.
- The study presents data on adult experiences in education and employment; which have been shaped by anti-discriminatory practice over a 23 year period.
- The social model of disability has been applied in this study to makes sense of the data findings.
- The findings illustrate the continuum effect of socio-economic status, and its impact on disability inequalities in adulthood.

Introduction

This study will apply a sociological approach to explore a relationship between social class and dyslexia. This article will commence by discussing the recent development of anti-discrimination policy relevant to the experiences of adults with this condition. The rise of anti-discriminatory policy will be discussed alongside alternative sociological interpretations of disability, i.e. the social model, with reference to its implications for inclusivity for adults with this condition. The literature review will progress into research exploring the impact of socio-economics on dyslexia, particularly within adulthood, to lay the foundations for this study exploring the intersectional relationship between dyslexia, socio-economics and disabling barriers. It should be noted that, although this study applies the social model of disability, the findings will be derived from quantitative rather than qualitative data. This is in line with recent developments within Disability Studies advocating the importance of utilising

qualitative *and* quantitative data to represent the lived experiences of disabled people with a focus on driving policy change and transforming professional practices (see Shakespeare 2013; Macdonald and Deacon 2018).

Anti-discriminatory policy

The concept of social inclusion has become a much used educational and employment discourse both in professional practice and social policy. The inclusion agenda developed in the Warwick Report (1978) advocated that children with 'special' educational needs should be educated within mainstream schools rather than in specialist institutions (Cole 2005). The Warwick Report (1978) significantly influenced the Education Act (1981), and later the Education Act (1996), with its advocacy for inclusive-practice within mainstream education. In conjunction with the 1980s educational reform, the Conservative and later New Labour governments developed an anti-discriminatory agenda that was initially applied in employment legislation. The first wave of legislation aimed at reducing discrimination against disabled people came in the form of the *Disability Discrimination Act* (DDA) in 1995. The DDA (1995) attempted to confront disability inequality by developing a civil rights approach for people with a range of impairments including dyslexia. It was influenced by the *Sex Discrimination Act* (1975) and the *Race Relations Act* (1976) and made it illegal to discriminate against disabled people within the workplace.

Although this Act was intended to remove discriminatory barriers in employment the terminology used in the policy referred to 'reasonable adjustment'. Unfortunately, this concept allowed employers the ability to interpret the meaning of 'reasonable' adjustment within their own organisations. Due to growing criticisms that the DDA (1995) was being

systematically ignored by employers because of the concept of reasonable adjustment, the Act was updated in 2005 (Roulstone and Warren 2006). The New Labour government introduced a Disability Rights Task Force in order to successfully implement this policy within practice. The 2005 Act was expanded to cover public transport and public authorities within its remit. This was subsequently replaced with the *Equality Act (2010)* which gave disabled people, including people with dyslexia, legal rights in employment, education, access to services and housing with an aim to protect them against disability discrimination. Therefore the rise of disability policy over recent years, protecting the rights of people with dyslexia and promoting awareness of the condition, is meant to have led to improvements in the identification of children and the inclusion of adults with dyslexia (Bartlett and Moody 2010; Macdonald 2013).

Defining the social model of disability

Disability discrimination legislation such as the Disability Discrimination Acts were significantly influenced by the disability movements in the USA and UK (Gerber, et al. 2012). Within the UK in the 1970s and 1980s disability activists drew attention to widespread structural discrimination resulting in social inequalities for disabled people. Disability activists, from organisations such as the Union of the Physically Impaired Against Segregation and the Liberal Network of Disabled People (Campbell and Oliver 1996), illustrated structural inequalities, referred to as disabling barriers, which resulted in disabled people being marginalised, both economically and socially, within education, employment and general life (Oliver 2009). Leading activists and Disability Studies scholars such as Vic Finklestein, Mike Oliver and Colin Barnes illustrated that social inequalities which discriminated against

disabled people were often justified based on assumptions about disabled people's pathologies (Barnes 2012).

Oliver (2009) suggests educational segregation and exclusion from employment has been justified through the notion that disabled people cannot take part in conventional activities due to their dysfunctional bodies. This deficit approach to disability is referred to as the biomedical or individual model of disability (Oliver 2009; Barnes 2012). The biomedical model defines disability and impairment as:

Impairment: any loss or abnormality of psychological, physiological or anatomical structure or function.

- *A deviation from a statistical 'norm' in an individual's biomedical status*
- *Includes loss/defect of tissue- mechanism-system-function*
- *Temporary or permanent*

Disability: any restriction or lack (resulting from impairment) of the ability to perform an activity in the manner or within the range considered normal for a human being.

- *Functional limitation expresses itself as a reality in everyday life*
- *Tasks, skills, and behaviour*
- *Temporary or permanent*

(Adapted from Semple *et. al.* 2013: 90)

This biomedical model has been challenged by Disability Studies scholars, who suggest what inhibits disabled people from engaging within education and employment is not due to a

'dysfunctional body', but because of structural and economic disabling barriers (Barnes 2012). This critical structural analysis of disability is referred to as the social model of disability. The social model was first defined in academia by Mike Oliver (1983) based on a definition of disability published by the Union for Physically Impaired Against Segregation (UPIAS). Oliver (2009) illustrates a working definition of the social model (from UPIAS);

Disability: a disadvantage or restriction of activity caused by a contemporary social organisation which takes no or little account of people who have... impairments and thus excludes them from the mainstream of social activities.

(Adapted from Oliver 2009: 42)

The social model redefines the concept of disability and impairment from an individual-problem to a social-problem resulting from social exclusion. From a social model perspective impairment is defined as a long-term biological, sensory or neurological variation (not a dysfunction). Disability is defined by how people with a range of impairments are systematically excluded from social participation in education, employment or general life. This differs significantly from the biomedical model referred to by Semple *et. al.* (2013). By applying the social model to dyslexia, dyslexia becomes a neurological variation, defined as *impairment*. Problems experienced by people with dyslexia are not due to this biological variation, but because of an education system that is not equipped to educate children with dyslexia, and a neo-liberal employment system which systematically excludes this minority group due to a lack of adjustment. The difficulties people with dyslexia experience in education and in employment are due to structural inequalities referred to as disabling barriers (Riddick 2001; Mortimore & Dupree 2008; Macdonald 2009; Campbell 2013; Collinson 2016). Hence, the

aim of the social model is to locate and remove disabling barriers to foster a social system based on inclusion rather than segregation.

The principles of social inclusion are not controversial and are now generally accepted within contemporary education and employment policy and practice across the UK. With reference to employment and educational legislation the concept of social inclusion has been associated with the social model of disability (Oliver 2009). Many policies locally and nationally locate the social model of disability as a reference point for anti-discriminatory and inclusive practice. Although many organisations claim to apply a social model approach Barnes (2012) states that this rarely happens in practice. Barnes suggests government policies are still defined by the bio-medical model, as access to support relates directly to the type of impairment a person has rather than the disabling-barriers they experience. For individuals with dyslexia, it is a disabling education system that disables which ultimately impacts on adult life (Riddick 2001; Macdonald 2009; Collinson & Penketh 2010). For Oliver (2009), although the government have implemented numerous policies aimed at inclusive practice in employment and education none have truly successfully overcome disability discrimination to date.

Dyslexia and Socio-economic Status

From a social model perspective the concept of disability is not fixed and is transformed by external social environments. According to Oliver (2009), people with the same impairments experience disability in different ways, depending on their social circumstances. Disabling barriers are affected by a range of social factors which affect and influence a disabled person's

ability to participate in social situations. Therefore people with dyslexia can be disabled in different ways due to a range of social structures such as socio-economics, gender and ethnicity which intersect with experiences of social inclusion and exclusion. As disability is socially constructed, in order to conceptualise dyslexia from a social model perspective, disabling barriers must be analysed with reference to a range of social circumstances including structural factors such as socio-economics.

Although a significant amount of research has been conducted illustrating the detrimental impact social class has on educational achievement (Reay 1998; Tomlinson 2017), very little research has been conducted investigating how socio-economics affect the experiences of people with dyslexia particularly in adulthood (Macdonald 2009). Thus, the majority of research which focuses on dyslexia in adulthood have explored issues of social deprivation but have not developed a specific social class analysis (see Selenius, et al. 2006; Yates, 2006, 2012; Dåderman 2012; Patterson et al., 2012; Macdonald and Deacon 2016). Previous research directly examining links between socio-economic status and dyslexia has predominantly focused on assessment and identification of children. A study by Siegel and Himel (1998) (n=634) discovered that the concept of IQ discrepancy directly discriminated against working-class children with dyslexia due to the design of the IQ test. They suggested working-class children's IQ decreased as they progressed through mainstream education. As dyslexia assessments were traditionally based on an IQ discrepancy between intellect and a child's literacy abilities, many working-class children were being categorised as poor readers due to socio-economic factors rather than because they had dyslexia. Therefore, Siegel and Himel's (1998) study illustrated an intersectional relationship between social class inequalities in education leading to under diagnosis of working-class children with dyslexia.

In a qualitative study (n = 13) by Macdonald (2009) analysing life histories of adults with dyslexia, he discovered that social class substantially affected the experiences of his participants. Macdonald states that participants from a middle-class background had increased access to a diagnosis, improved access to specialised education and far more knowledge of assistive technologies. The study indicated that because individuals from middle-class backgrounds were more likely to have access to assistive technologies, this reduced the disabling factors they experienced in adult life compared to working-class participants (Macdonald 2009). In Macdonald's (2012) quantitative study (n=77), he suggested there was a significant ($p = 0.00$) relationship between diagnosis and socio-economic status. This study presented evidence that the average age of assessment was 15 years for participants from the upper socio-economic group. This increased to 19 years for the intermediate group and 32 years for the manual group (Macdonald 2012:91). The study illustrated inequalities were present within the diagnostic process for working-class participants. Macdonald (2012) also suggested educational qualifications and unemployment rates differed significantly between social classes. Macdonald's (2012) findings seem to demonstrate that working-class participants were far more likely to be unemployed and have no qualifications compared with participants from the higher socio-economic groups.

Research question and hypothesis

In the current study, the authors aspired to extend and update the previous literature on dyslexia and social class (Siegel and Himel 1998; Macdonald 2009; 2012). By developing research on dyslexia and social class, this article will analyse data from 442 participants across a range of ages, examining the impact of socio-economics on their experiences of dyslexia.

The research question asked 'Does socio-economic status increase experiences of discrimination for adults with dyslexia?' This study therefore investigates the intersectional relationships between socio-economic status and dyslexia with reference to perceived inequalities. The research hypothesis proposes that 'socio-economic status increases experiences of discrimination in adult life for people with dyslexia'. It should be noted that the data analysis is interpreted from a social model perspective, and although the study presents data on difficulties experienced by adults with dyslexia, these difficulties will be conceptualised as resulting from disabling barriers rather than due to a pathological 'dysfunction'.

Methodology

The aim of this project was to explore the adult experiences of people with dyslexia living in the UK. This examined the educational and employment experiences of this population in relation to socio-economic status. The study employed a quantitative methodology and recruited participants from different socio-economic backgrounds. Data was collected by means of an online survey.

Survey design

When developing the survey, accessibility was at the forefront of our questionnaire design. The team piloted the survey on students with dyslexia in order to improve the design and accessibility of the survey. Student completion times ranged from 3 to 10 minutes, which averaged to less than 5 minutes. As reading speeds differ for adults with dyslexia, we decided to give an approximate 3 to 10 minutes completion time on the participants' information sheet. The questionnaire consisted of 29 closed-ended questions, with the option of 'other'

within the text box so participants could add an answer if the closed answers did not represent their experiences. We used yellow as our background colour, and the questionnaire could be completed on a PC, laptop, tablet computer, mobile phone or on hard copy. Assistive technologies such as dictate or text-to-read software could be used to assist potential participants in completing the survey.

Survey sample

The survey was sent out to organisations across the UK which supported adults with dyslexia. To collect data on dyslexia and social class, a cross-sectional, mixed-mode method was developed, using a survey that could be completed online or on hard copy (Fricker 2016). It was distributed in a variety of ways to ensure the inclusion of participants from a wide range of social demographics nationally; particularly to access socially excluded populations. This project had been widely publicised by third sector and educational organisations, and residents could 'opt in' to complete the online survey. However, this approach was supplemented by educationalists and third sector employees in order to increase the sample size and diversity of participants. The survey also appeared on a number of social media websites which were used by people with dyslexia. The study took place from 2015–2017 which initially produced a sample size of 478 participants however this population was reduced due to a number of factors; those participants under 16years-of-age were removed; also anyone living outside the UK; and participants that had completed the survey more than once. The CHERRIES checklist has been used in order to consider the nature and representation of the sample used in this study (Eysenbach 2012). With reference to response metrics (i.e. response rates), there was a 79% completion rate, which has been calculated by comparing the number of members

of the public who viewed the survey with the number of individuals who completed the questionnaire (Eysenbach 2012). Although this study was anonymous in design, participants could volunteer to leave an e-mail address if they wanted to take part in the second qualitative stage of the study. IP addresses could also be viewed on the online survey programme, allowing the team to check if single users had completed the questionnaire multiple times. Therefore, after the data was cleaned, where participants under the age of 16, non-UK citizens and single users who had completed the questionnaire multiple times had been removed, the sampled population consisted of 442 participants.

Measures

To calculate a person's socio-economic background the survey collected data consisting of a person's economic, social and cultural experiences. The socio-economic groups were organised into three social class categories consisting of working-class, middle-class and elite groups. The socio-economic definition that was employed in this survey applies Mike Savage's 'New Model of Social Class' to define socio-economics (see Savage, et al. 2013). Within this definition there are seven categories of social class: elite, established middle-class, technical middle-class, new affluent workers, traditional working-class, emergent service workers and precariat (Savage, et al. 2013). These seven categories are calculated based on household income, occupational roles, education, savings, housing value, and cultural capital (i.e. leisure activities, etc.). These were then organised into three socio-economic categories consisting of the elite (i.e. elite group), middle-class (i.e. established middle-class and technical middle-class groups) and working-class (i.e. new affluent workers, traditional working-class, emergent service workers, precariat groups) (see Savage, et al. 2013 for a detailed overview). With reference to defining dyslexia, participants had to confirm they had received a professional

assessment or diagnosis; they had to state the age they were diagnosed; and give details of the organisation that had issued the dyslexia diagnosis. This data was used to confirm that a participant had dyslexia (n = 354). Participants also had an option to self-identify as having dyslexia, where those individuals stated that they were dyslexic but had never been formally diagnosed with the condition (n = 88). Initially this group was removed from the data analysis, but then added back in at a later date in order to compare whether those 88 participants made a significant difference to the overall results. With reference to the data findings, there were no statistically significant differences between the groups (with the exception of table 1), and the 88 self-identifying participants had very little impact on the data findings or conclusions of this study. Yet by adding these participants it gave the authors information on which socio-economic groups were most and least likely to have received a formal diagnosis, in comparison to those who self-identified and do not have the means to validate or refute their concerns. Therefore the data findings presented in this article draws on a sample size of 442 cases including participants who have been formally diagnosed with dyslexia (n = 354) and those who self-identify as having the condition (n = 88).

Data analysis

It should be noted that the authors are influenced by a critical realist philosophy regarding disability and impairment and this paper employs the social model of disability in respect of the data analysis (see Macdonald 2013). Hence the authors apply the social model definition, which classifies 'disability' as disabling structural barriers and 'impairment' as a biological/neurological variation (Oliver 2009). The data was analysed using descriptive statistics in the form of cross-tabulation tests to examine the frequency distribution of cases. This was to examine any correlations between two or more variables. The statistics collected from the

survey consisted of either nominal or ordinal level data. From a sociological perspective, a cross-tabulation examination is the preferred statistical test when analysing these types of data (Bryman 2016). This test enabled the team to examine descriptive relationships within the data which would not become apparent by using averages (i.e. analysis of the mean). Therefore, two or more variable frequency distributions were analysed using a chi-square statistic (χ^2) to discover whether variables (i.e. dyslexia \times socio-economics = increased/decreased social exclusion) were statistically independent or whether they are associated (De Vaus 2002). It should be noted that where the *expected count* fell below five in the data analysis, a *Fisher's Exact Test* was used to confirm statistical significance. The data from this survey were subsequently analysed, and only data which were calculated to be of significance are presented in this article ($P \leq 0.05$). The data were analysed using SPSS in the form of single variable analysis (univariate), and where data were calculated to be of significant ($P \leq 0.05$) bivariate analysis was applied (De Vaus 2002). In the data analysis, three significant themes ($P \leq 0.05$) emerged in the bivariate data, which were: dyslexia identification; educational experiences; perceptions of employment.

Findings: Social demographics

In the social demographic data (see table 1) there was a slight gender bias in this study as 59.3% of participants were female compared to 40.7% males. With reference to age, there was a relatively wide-ranging age spread throughout the sample extending from 17 to 72 years. The study was, to some extent, dominated by younger participants as 26.9% were from the 30 to 39 age category followed by 22.4% from the 22 to 29 age group. Only 13.3% of participants were from the 17 to 21 age group followed by 15.4% that were from the 50 to 72 age categories. With reference to ethnicity, 87.3% of participants reported being from a

white ethnic group, compared with 12.7% that identified as coming from a minority ethnic background. The ethnic population sample in this study closely matched the UK's ethnic population of 13% (see Office for National statistics 2011). When exploring the sample's socio-economic population, 48% of participants were from a middle-class background, and 48% were from a working-class background. As expected, the sample had a relatively small population of individuals (4.1%) who could be classified as belonging to an 'elite' socio-economic position. In total, 80.1% of the sample had received a dyslexia diagnosis, whereas 19.9% identified as having dyslexia but had not obtained a professional assessment. Thus data presented in this study is generated at a bivariate-level where a number of significant relationships ($P \leq 0.05$) emerged concerning socio-economic status and dyslexia ($n = 442$).

Table 1: Social demographics

Dyslexia assessment and socio-economic status

In the first stage of analysis the findings explored if working-class participants were less likely to have access to a dyslexia diagnosis/assessment compared with other social class groups. Therefore a socio-economic comparison was made between the group that had received a professional diagnosis and individuals who self-identified as having dyslexia (see table 2). A significant relationship ($p = 0.00$) was discovered between socio-economics and access to a dyslexia assessment. As the data indicates, 86.8% and 83.3% of the middle-class and elite groups reported obtaining a formal diagnosis, respectively. The likelihood of a person having access to a dyslexia assessment decreases to 73.1% for working class participants. Although the team recognises that there was a strong possibility that the self-identified group may have dyslexia, it would be impossible in this study to confirm a diagnosis for these participants.

Nonetheless, these data findings may indicate that it is the working-class group who are less likely to receive a formal diagnosis compared with the other socio-economic groups in this study.

When comparing socio-economic status with the age that participants were diagnosed and the organisation that administered the assessment, a number of significant findings appeared within the data analysis. As can be observed in table 2, there was a significant variance ($P = 0.00$) between socio-economic status and the age of diagnosis. The key disparity appeared between the ages of 4 to 16 years. It was during this period that 55.6% of the elite group were assessed and diagnosed with dyslexia. This decreased significantly with reference to the middle-class group, as only 30.8% of this group were diagnosed between the schooling ages of 4 to 16 years. This reduced further for the working-class group, as only 25.5% of participants who received a dyslexia diagnosis were aged between 4 and 16 years. Furthermore, the data also reveals that participants from the working-class group, at 27.9%, were least likely to receive a formal diagnosis during their entire life course.

There was also a significant difference ($P = 0.00$) between socio-economic status and the type of organisation administering an assessment for participants in this study (see table 2). With reference to socio-economic status, 38.9% of the elite group received a diagnosis by an educational specialist accessed by their schools. This dropped when comparing participants in the lower socio-economic groups. Only 33% of the working-class group accessed a diagnosis from their schools and this decreased to 26.2% of the middle-class group. Interestingly, with reference to private assessment only 17.5% of the working-class group accessed a diagnosis outside of the education system from private means. This increased to 27.2% of the middle-class

group and 38.9% of the elite group. This increase is not unexpected as families with access to increased economic resources are more likely to pay for an assessment if one cannot be obtained within mainstream schools (Macdonald 2010). Finally, it was the middle-class group that were most likely to receive an assessment or diagnosis when studying at university (43.6%), whereas only 5.6% of the elite group accessed a diagnosis at university level.

Table 2: Socio-economics and assessment trends

Dyslexia, Socio-economics and Education

With reference to educational experiences and dyslexia, it should be noted that all participants from across the socio-economic categories reported that dyslexia had a perceived negative impact on their educational experiences (see table 3). More than half of participants (52.3%) reported experiencing severe problems in primary school. This increased to 60.3% of participants that reported experiencing severe problems during secondary school education. After graduating from secondary education, severe problematic educational experiences seem to slightly decrease to 47.4% at college and 41.8% at university. Interestingly, very few participants reported experiencing no difficulties during different stages of their educational journeys (see table 3).

When exploring the effect that dyslexia has on educational experiences with reference to socio-economic status, key differences ($p = 0.00$) emerge in relation to the working-class and upper socio-economic groups. As can be observed in table 4, 55.6% of the working-class

group suggest their overall educational achievements were severely affected by dyslexia. This decreases to 43.8% for the elite group and 36.9% of the middle-class group. Although both the elite group (31.3%) and the middle-class group (28.7%) suggest dyslexia did not impact on their educational experience, this data seems to reveal that working-class participants perceived themselves as being more profoundly affected by the condition in education. Interestingly, ($P = 0.00$) it was also the working-class group which were most likely to suggest dyslexia restricted them from accessing a college or university place (47.8%). Only 27.8% of the elite group suggested dyslexia prevented them from studying at university level, whereas only 15.2% of the middle-class group agreed with this statement. Although all participants report dyslexia impacting on their educational experiences, it is the working-class group that seems to perceive dyslexia as having the greatest impact throughout their educational journeys.

Table 3: Impact that dyslexia has on educational experiences

Table 4: Socio-economics, educational achievement and dyslexia

Dyslexia in Adulthood

When exploring the affect that dyslexia has on experiences in adulthood with reference to socio-economic status, a number of significant relationships ($P \leq 0.01$) emerge with reference to literacy difficulties. When examining the aspects of literacy skills that most commonly affect adult life, contrasting experiences were reported by participants from difference socio-economic groups. Although all participants reported that literacy difficulties had a significant impact in adulthood, it was the working-class group (66%) who reported having the most difficulties with writing or spelling ($p = 0.01$). This decreased to 51.3% for the middle-class group and 50% for the elite group. A similar trend can be observed with reference to reading ($p =$

0.00). Once more it was working-class participants (44.9%) that reported having considerable difficulties in this area. This decreases for the middle-class group to 29.9% and declines further to 22.2% for the elite group. This data seems to reveal that it is the working-class group where reading and writing is most severely affected in adult life. Finally, the data findings in table 5 reveal that for the vast majority of participants, dyslexia has a persistent effect on their daily activities ($p = 0.05$). Therefore, 72.9% and 77.8% of participants from the working-class and the elite groups respectively reported that dyslexia affects their daily routines. For middle-class participants dyslexia seems to be conceptualised as having a lesser of an impact (66.7%) on their lives compared with the other groups. Very few participants reported that dyslexia does not, or only occasionally, have an impact on their general lives. Once more it was the middle-class group (14.5%) who most commonly suggested that dyslexia only had a minimum affect in adulthood.

Table 5: Socio-economics and the impact of dyslexia in adulthood

The Impact of Assistive Technologies in Adult Life

Within previous studies of social class, technology played a substantial role allowing middle-class participants the devices to affectively develop coping strategies to survive in a disabling workplace (Macdonald 2009). When exploring the relationship between technology and socio-economic status, only two significant relationships ($p = 0.00$; 0.01) emerged with reference to the use of technologies. This finding relates to the use of personal computers/laptops and the use of computer tablets to assist literacy skills. As can be viewed in table 7, only 57.1% of working-class participants used a personal computer to assist literacy activities in adult life, which increased significantly with reference to the elite group at 88.9% and the middle-class group at 78.8%. Interestingly it has been widely reported that tablet

computers have transformed the lives of people with dyslexia, yet only 45.7% of participants in this study used this form of technology to assist them in their daily literacy activities. With reference to socio-economic status, only 38.2% of the working-class group used tablet computers to assist their literacy skills, which increased to 50% for the elite group, and 52.8% of middle-class participants. However, when examining if participants utilised assistive dyslexia software (i.e. Dragon Dictate, Texthelp, etc.) to aid them with reading, writing and organisational skills (see table 6), it was discovered that very few participants in this study used these technologies. Furthermore, the use of these assistive technologies was not significantly affected ($p \geq 0.06$) by socio-economic status. Although the vast majority of participants in this study used a laptop or PC, only 21% used dictate software to assist their typing and written work. Furthermore, only 35% used text-to-speech technology to assist their reading or writing. Similarly, only 30.3% of participants reported using an electronic organiser. Therefore, the data in this study shows that, although digital technology may have the ability to improve people's lives, specialised assistive technologies are not widely used by participants in this study.

Table 6: Dyslexia and the use of personal computers to assist literacy in adulthood

Table 7: Dyslexia and assistive technologies

Dyslexia and employment

When exploring the impact that socio-economics and dyslexia has on experiences of employment a number of significant findings ($p = 0.00$) emerge from the data. As can be observed in table 8, it is the working-class group (47.5%) which is least likely to be in employment. These employment trends increase significantly at 70.2% for the middle-class

group and at 72.2% for the elite group. Interestingly, it is the working-class group who reported the highest unemployment rates (19%) of the sample. This decreases to 13.6% for the middle-class group, whereas none of the elite group reported being unemployed. Interestingly, 32.3% of the working-class group reported being a student at the time of this study, which is a significantly greater number than the other two groups. It should be noted that this figure may mask a greater unemployment rate for this group due to government training courses. The study also examined if participants considered that dyslexia had prevented them from gaining employment during their adult lives. In response to this no significant relationship emerged concerning socio-economic status and restricted employment opportunities ($p = 0.38; 0.23$), however 35.8% of participants from across the socio-economic groups suggested that they suspected dyslexia had prevented them from accessing employment. Surprisingly, a further 44.4% of participants felt they had missed out on promotion opportunities due to the fact that they had dyslexia.

Table 8: Socio-economics, dyslexia and employment

Table 9: Socio-economics, dyslexia and employment

Discussion

This article presents data on the experiences of adults with dyslexia. These experiences have occurred during a period of inclusive education and anti-discriminatory policy over the past 23 years (see the *Special Educational Needs and Disability Act, 2001; Disability Discrimination Acts, 1995; 2005; Education Act, 2010; Equality Act 2010*). Within employment, due to the *Disability Discrimination Acts* and *Equality Act*, organisations have a legal obligation to make 'reasonable adjustments' to working environments for disabled people, including individuals with dyslexia (Konur 2005; Roulstone and Warren 2006). At a social policy-level there has been a significant commitment to anti-discriminatory practice within education and employment,

yet data in this study illustrates these policies have had only a marginal effect on the lives of participants, particularly those from working-class backgrounds. The findings in this study illustrate that improvements are still necessary with reference to early identification, educational adjustment and inclusive employment practices for people with dyslexia.

With reference to early identification, this study demonstrates that for the majority of participant's dyslexia was not identified until after secondary school education. As the findings indicate, age of diagnosis was affected by socio-economic status (Siegel and Himel 1998), as working-class participants, at 25.5%, were least likely to receive a diagnosis during mainstream schooling. It was also this group, at 27.9%, that was the most at-risk category of participants who had not had access to a formal diagnosis/assessment to date. It was only participants from the elite group, at 55.6%, where dyslexia was most commonly diagnosed before the age of 16 years. However, it should be noted that improvements have been made over the past 10 years when comparing these findings in this study to the findings from Macdonald's (2012) research. In Macdonald's study the average age of diagnosis for the working class group was 26 years, this decreased for the middle-class group at 19 years and for the elite group at 15 years. Furthermore, similarities occur between this study and Macdonald's (2009) qualitative study which suggested middle-class participants were more likely to access an assessment through private means. Macdonald's study proposed that an increase in dyslexia assessment was due to middle-class families paying for a diagnosis rather than improved dyslexia awareness in mainstream middle-class schools. The analysis in this study somewhat corroborates these findings, as 27.2% of the middle-class group and 38.9% of the elite group were diagnosed by a private organisation, compared with 17.5% of the working-class group. However, this study also identified that growth in dyslexia assessment

can also be attributed to improvements in diagnosis at university level for both the middle-class and working-class groups, at 32.7% and 26% respectively. Therefore, the study seems to identify a significant barrier with reference to early identification of dyslexia within the mainstream schooling system. It should be noted that although the age of an early diagnosis has improved, this may be partly because of more parents and adults paying for a diagnosis, or universities assessing their students, rather than specific improvements in mainstream education.

With reference to educational adjustment a number of disabling barriers emerged within the data findings. Although it was working-class participants (55.6%) that reported the greatest impact on their educational journeys, very few participants, at 22.4%, suggested that dyslexia had no impact on their educational experiences. From a bio-medical perspective these findings would be conceptualised as resulting from the dyslexic child's inability to cope in mainstream education, although this study suggests that these difficulties in education are due to inaccessible teaching methods and a failure at a governmental-level to achieve an effective inclusive education agenda (Riddick 2001; Collinson and Penketh 2010; Macdonald 2013).

With reference to disabling barriers in employment, again workplace inequalities experienced by participants in this study were significantly affected by a person's socio-economic background (Macdonald 2009; 2012). Hence, socio-economic status impacted on participant's adult experiences as the working class group suggested experiencing more profound literacy difficulties, with reference to writing (66%) and reading (44.9%), compared with the other socio-economic groups. Surprisingly the data findings revealed that very few

participants engaged in assistive technologies or software to support them in the workplace. Although the majority of participants from the middle-class (78.8%) and elite groups (88.9%) used a laptop or PC to assist their literacy skills, it was working-class participants (57.1%) who were least likely to use this technology in adult life. Yet, very few participants from across the socio-economic groups use technologies such as dictate software (21%) or text-to-speak software (30.5%) to assist their literacy skills within the workplace.

Yet, all three socio-economic groups perceive dyslexia as having a significant impact in their adult lives. As discussed, 79.4% of working-class groups, 77.8% of the elite group and 66.7% of the middle-class group report that dyslexia had a constant impact on their daily lives. The findings also revealed that it was working-class participants who were most likely to experience higher levels of unemployment compared with the other groups. Although there was a variation between socio-economic groups, participants from working-class and middle-class backgrounds reported some level of unemployment. Furthermore, all socio-economic groups expressed concerns about dyslexia impacting on their career progression. Therefore, when applying Oliver's (2009) and Barnes's (2012) social model perspectives to comprehend problems faced in employment, these experiences are conceptualised as resulting from structural inequalities that alienate adults with dyslexia in the contemporary labour market and in general life.

Implications and conclusions

This study interprets the data findings from a social model perspective, therefore difficulties experienced by participants are not theorised as resulting from an impairment effect but due to significant disabling barriers within adult life. This article has applied the social model to

experiences of adults with dyslexia and although the data reveals inequalities due to socio-economics that impacted on diagnosis, education and employment, the findings also revealed universal disabling barriers which affected all participants. The authors suggest two practical solutions to remove disabling barriers in order to improve diagnosis and inclusive practice in education and employment.

Firstly, the current process of identifying dyslexia within education needs to be updated particularly in line with the new Education, Health and Care Plans introduced by the Conservative government (Macdonald 2013). The authors suggest that children, families and adults should have access to an assessment not just in education but also through the National Health Service consistent with other impairments such as Attention Deficit Hyperactivity Disorder and Autistic Spectrum Disorders. Therefore, to improve early diagnosis if a family has concerns that their child may have dyslexia (and this concern is dismissed by their schools) an educational psychologist should be accessed through a local GP. It should not be up to the parents or even adults to access an assessment through private means.

Secondly, the authors argue that assistive technologies can help children and adults with dyslexia to overcome many literacy difficulties in education and in the workplace (Macdonald 2009). The authors argue that children and adults with dyslexia engage in literacy skills in different ways and use different technological tools compared with the neurological typical communities. A key barrier is the lack of focus on using assistive technologies to improve literacy skills in education which leaves individuals ill-equipped in adulthood after graduating from education and entering the labour market.

To conclude this study suggests that further research is needed from a social model perspective to understand the lived experiences of people with dyslexia both in childhood and in adulthood. This will allow a political dimension to studies into dyslexia to challenge social inequalities and foster a less tokenistic model of inclusion and anti-discriminatory practice, both in education and in adult life.

Limitations

Despite the strength of the overall design of this study, a number of limitations must be considered. Firstly, the survey was conducted online, and although this gave the authors access to a greater number of participants, it did not allow us to create a sample frame or randomly select a representative population. Secondly, all variables were based on self-reporting; hence it is possible that participants unintentionally misinformed the researchers collecting data in this survey. Finally, the type of data analysis conducted here only allows for a very broad overview of social exclusion with reference to the complex experiences of individuals with dyslexia. Although there are a number of key limitations to this study, the project offers one of the largest surveys conducted on this hidden population to date from a sociological perspective.

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Tables:

Table 1: *Social demographics*

Characteristics	Percent	n
Sex	100%	437
Male	40.7%	178
Female	59.3%	259
Age	100%	428
17 - 21	13.2%	57
22 - 29	22.4%	96
30 - 39	26.9%	115
40 - 49	22%	94
50 - 59	12.4%	53
60-72	3.0%	13
Social Class	100%	442
Elite	4%	18
Middle-class	48%	212
Working-class	48%	212
Ethnic Groups	100%	432
White	87.3%	377
Mixed	7.2%	31
Asian	2.3%	10
Black	3.2%	14
Dyslexia Diagnosis	100%	442
Yes	80.1%	354
No	19.9%	88

Notes: n = participant numbers

Table 2: *Socio-economics and assessment trends*

Characteristics			Elite	Middle-class	Working-class	Sig.		
Dyslexia diagnosis	Yes	n	15	184	155	P = 0.00*		
		%	83.3%	86.8%	73.1%			
	No	n	3	28	57			
		%	16.7%	13.2%	26.9%			
	Total	n	18	212	212			
		%	100.0%	100.0%	100.0%			
Age of diagnosis	4-16	n	10	65	52	P = 0.00*		
		%	55.6%	30.8%	25.5%			
	17 +	n	5	118	95			
		%	27.8%	55.9%	46.6%			
	Never	n	3	28	57			
		%	16.7%	13.3%	27.9%			
	Total	n	18	211	204			
		%	100.0%	100.0%	100.0%			
	Place of diagnosis	School/College	n	7	53		66	P = 0.00*
			%	38.9%	26.2%		33.0%	
University		n	1	66	42			
		%	5.6%	32.7%	21.0%			
Charity/Private		n	7	55	35			
		%	38.9%	27.2%	17.5%			
None		n	3	28	57			
		%	16.7%	13.9%	28.5%			
Total		n	18	202	200			
		%	100.0%	100.0%	100.0%			

Notes: n = participant numbers

* Fisher's Exact Test = $p \leq 0.05$

** Chi-square = $p \leq 0.05$

Table 3: *Impact that dyslexia has on educational experiences*

Education level	Impact of dyslexia	Percent	n
Impact of dyslexia in primary school		100%	375
	Not a Problem	19.5%	73
	Problem	28.3%	106
	Severe Problem	52.3%	196
Impact of dyslexia in secondary school		100%	375
	Not a Problem	9.9%	37
	Problem	29.9%	112
	Severe Problem	60.3%	226
Impact of dyslexia in college		100%	325
	Not a Problem	19.1%	62
	Problem	33.5%	109
	Severe Problem	47.4%	154
Impact of dyslexia in university		100%	294
	Not a Problem	19.4%	57
	Problem	38.8%	114
	Severe Problem	41.8%	123

Notes: n = participant numbers

Table 4: *Socio-economics, educational achievement and dyslexia*

Characteristics			Elite	Middle Class	Working Class	Sig
Educational Impact	Not a Problem	n	5	56	16	P = 0.00*
		%	31.3%	28.7%	12.0%	
	Problem	n	4	67	43	
		%	25.0%	34.4%	32.3%	
	Severe Problem	n	7	72	74	
		%	43.8%	36.9%	55.6%	
Total	n	16	195	133		
	%	100.0%	100.0%	100.0%		
Impact on College/ University Place	Yes	n	5	30	75	P = 0.00**
		%	27.8%	15.2%	47.8%	
	No	n	13	167	82	
		%	72.2%	84.8%	52.2%	
	Total	n	18	197	157	
		%	100.0%	100.0%	100.0%	

Notes: n = participant numbers

* Fisher's Exact Test = $p \leq 0.05$

** Chi-square = $p \leq 0.05$

Table 5: *Socio-economics and the impact of dyslexia in adulthood*

			Elite	Middle Class	Working Class	Sig
Spelling	No Effect	n	6	42	18	P = 0.01*
		%	33.3%	21.3%	11.5%	
	Moderate Effect	n	3	54	35	
		%	16.7%	27.4%	22.4%	
	Severe Effect	n	9	101	103	
		%	50.0%	51.3%	66.0%	
Total	n	18	197	156		
	%	100.0%	100.0%	100.0%		
Reading	No Effect	n	10	67	30	P = 0.00**
		%	55.6%	34.0%	19.2%	
	Moderate Effect	n	4	71	56	
		%	22.2%	36.0%	35.9%	
	Severe Effect	n	4	59	70	
		%	22.2%	29.9%	44.9%	
Total	n	18	197	156		
	%	100.0%	100.0%	100.0%		
Problems	Occasionally	n	2	30	12	P = 0.00*
		%	11.1%	14.5%	6.9%	
	Daily to weekly	n	2	39	24	
		%	11.1%	18.8%	13.7%	
	Constantly	n	14	138	139	
		%	77.8%	66.7%	79.4%	
Total	n	18	207	175		
	%	100.0%	100.0%	100.0%		

Notes: n = participant numbers

* Fisher's Exact Test = $p \leq 0.05$

** Chi-square = $p \leq 0.05$

Table 7: *Dyslexia and assistive technologies*

Use of Technology		Percent	n
Computer Tablet (e.g. I-pad, Kindle etc.)		100%	442
	Yes	45.7%	202
	No	54.3%	240
Dictate software		100%	442
	Yes	21.0%	93
	No	79.0%	349
Text-to-Speak Technology		100%	442
	Yes	30.5%	135
	No	69.5%	307
Electronic organiser		100%	442

Yes	30.3%	134
No	69.7%	308

Notes: n = participant numbers

Table 6: *Dyslexia and the use of personal computers to assist literacy in adulthood*

			Elite	Middle Class	Working Class	Sig
PC/Laptop/Notebook	Yes	n	16	167	121	P = 0.00**
		%	88.9%	78.8%	57.1%	
	No	n	2	45	91	
		%	11.1%	21.2%	42.9%	
	Total	n	18	212	212	
		%	100.0%	100.0%	100.0%	
Computer Tablet (e.g. I-pad, Kindle etc.)	Yes	n	9	112	81	P = 0.00**
		%	50.0%	52.8%	38.2%	
	No	n	9	100	131	
		%	50.0%	47.2%	61.8%	
	Total	n	18	212	212	
		%	100.0%	100.0%	100.0%	

Notes: n = participant numbers

* Fisher's Exact Test = $p \leq 0.05$

** Chi-square = $p \leq 0.05$

Table 8: *Socio-economics, dyslexia and employment*

			Elite	Middle Class	Working Class	Sig
Employment status	Employed	n	13	139	75	P = 0.00*
		%	72.2%	70.2%	47.5%	
	Unemployed	n	0	27	30	
		%	0.0%	13.6%	19.0%	
	Retired	n	3	3	2	
		%	16.7%	1.5%	1.3%	
	Student	n	2	29	51	
		%	11.1%	14.6%	32.3%	
	Total	n	18	198	158	
		%	100.0%	100.0%	100.0%	

Notes: n = participant numbers

* Fisher's Exact Test = $p \leq 0.05$

** Chi-square = $p \leq 0.05$

Table 9: *Dyslexia and employment*

Perceptions of the impact that dyslexia has on employment		Percent	n
Gaining employment		100	371
Yes		35.8	133
No		64.2	238
Gaining promotion		100	363

Yes	44.4	161
No	55.6	202

Notes: n = participant numbers

