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Entrepreneurs with Dyslexia in Singapore: The Incidence, Their Educational Experiences, and Their Unique Attributes

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Abstract

The incidence of dyslexia in the Singaporean entrepreneurial population is unknown. This study compares Singaporean Entrepreneurs who have dyslexia and those who do not have dyslexia. This research examines the education experiences and personal attributes of Singaporean Entrepreneurs, to identify the differences between those with dyslexia and those who are not dyslexic. A survey was conducted over a 12-month period and the data revealed that the incidence of dyslexia in the Singapore entrepreneurial population was 26%, this is more than 2.5 times that dyslexia would be found in the general population. The educational experiences of dyslexic entrepreneurs were significantly negative for primary and secondary education, however, in tertiary education, their educational experiences were significantly positive. Dyslexic entrepreneurs indicated two of the major factors why they were inspired to start their own business, these were to have ‘control’ over their lives, time, and success and the other was because of their ‘dyslexia’. Singapore entrepreneurial traits were explored and there is a tendency for Singaporeans to answer positively yet dyslexic entrepreneurs scored significantly less in empathy, interpersonal skills, public speaking, and memory ability compared to their non-dyslexic peers. Two attributes where dyslexic entrepreneurs scored significantly higher were visual thinking and visual-spatial ability. The findings from this research can be used to support the development of policies and support for Dyslexic Entrepreneurs in Singapore.

Keywords: dyslexia, entrepreneurship, education, positive dyslexia, specific learning differences, visual thinking, visual-spatial ability.

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INTRODUCTION

Research into the incidence of dyslexia in entrepreneurship found that there were twice as many entrepreneurs who had dyslexia than in the general population in the UK. (Logan, 2008). Logan (2009) subsequently identified an even higher incidence in the US of more than 3 times at 35% (Logan, 2009). Logan's research is used as a benchmark when discussing and researching dyslexia and entrepreneurship. (Adams, 2016; Alexander-Passe, 2016; AMA, 2008; Bowers, 2007; Cowen and Sherman, 2012; Coppola, 2007; de Bruyne, 2016; Eide and Eide, 2011; Economist, 2009 & 2012; Field, 2018; Franks and Frederick, 2013; Halfpenny and Halfpenny, 2012; Markowitz, 2011; Nicolson, 2015; Schneps, 2015; Schumpeter, 2012; Sunday, 2015a, 2015b; Sutton, 2012; Tickle, 2015, Warren, 2008). Logan (2011), in commentary about entrepreneurs with dyslexia, indicated that they were doing things quite differently in business and that they were particularly good at communicating their vision, harnessing people's strengths and in turn delegating to these strengths. She further indicated that they were intuitive, possibly using their right brain thinking skills to be successful in business. Logan felt that we had a lot to learn from these strengths and that all entrepreneurs could learn to harness these skills (Logan, 2011).

In Singapore, a study on entrepreneurs with dyslexia has not been undertaken. The late President of the Dyslexia Association of Singapore (DAS), Dr Daruwalla (DAS President from 1991 to 2016), called for this research to be conducted so that Singapore could recognise those with dyslexia and how they would be contributing to the economy of Singapore and its society (Daruwalla, 2014). Dr Daruwalla would quote the findings of the CASS Business School's research on Dyslexic Entrepreneurs and would emphasise the importance of the positive aspects and talents of dyslexia. At the launch of the DAS 'Embrace Dyslexia' campaign, he stated, "It has been known for some time that dyslexic business people are more likely to succeed as entrepreneurs... perhaps a study should be conducted in Singapore, and soon." (Daruwalla, 2015, p xvi).

AIM OF THE STUDY

The incidence of dyslexia in the Singapore entrepreneurial population is unknown. The Dyslexia Association in Singapore (DAS), an organisation that is considered to be an expert in the support of children with learning differences, as well as one of the leading educators of professionals who extensively support students with learning differences (Fawcett, 2014), has a significant gap in the services provided to adults with learning differences and in understanding their experiences in the workplace. Therefore, understanding the experience of adults with dyslexia in the Singaporean work environment is crucial for the organisation to create programmes and resources to support adults with dyslexia which is beyond its current scope of work (DAS, 2019b). It will also help to inform the development of policy in Singapore for adults with dyslexia.

RESEARCH QUESTIONS

This research study aims to answer the following research questions:

1. What is the incidence of dyslexia in the Singaporean Entrepreneurial population?
2. What are the educational experiences of Singaporean Entrepreneurs with dyslexia?
3. What are the unique attributes, if any, that distinguish Singaporean Entrepreneurs with dyslexia?

Examining the experience of Singaporean Entrepreneurs with dyslexia informs us of their unique experience and how these individuals contribute to Singaporean society.

DEFINITION OF DYSLEXIA AND OTHER LEARNING DIFFERENCES

The Dyslexia Association of Singapore (DAS) defines dyslexia as:

“a type of specific learning difficulty identifiable as a developmental difficulty of language learning and cognition. It is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling. Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory, and processing speed. An appropriate literacy programme should include the following components: phonemic awareness, phonics, fluency, vocabulary and comprehension.” (DAS, 2019).

The Dyslexia Association of Singapore (DAS) draws upon three significant reports in its definition of dyslexia, the Rose Report from the UK (Rose 2009) and two from USA, the US Department of Education Report, (IDEA, 2011) and the National Reading Panel Report (NICHD, 2000). These reports are used to drive policymaking and funding decisions to support individuals with learning difficulties.

Alexander-Passe (2017), a dyslexic and author of numerous books about dyslexia, discusses the issue of defining dyslexia in his latest book, “The Successful Dyslexic” and writes that there is, “no single, definitive diagnosis or definition of dyslexia... [it is on] a spectrum of difficulties, with some mild and others more severe. Therefore, it is rare to find two dyslexics with exactly the same range of difficulties. However, there are commonalities in all dyslexics” (Alexander-Passe, 2017, p1). He goes on to suggest that comorbidity of other learning differences, such as dyscalculia, dyspraxia and Attention Deficit Hyperactivity Disorder (ADHD), also confuses the issue of learning differences with the overlapping of other difficulties faced with coordination, fine motor skills, balance, handwriting, and attention (Alexander-Passe, 2017).

SPECIFIC LEARNING DIFFERENCES (SPLD)

DAS defines the term, Specific Learning Differences (SpLD), to describe several learning differences and on many occasions, the term SpLD can be used in the same context as dyslexia, which is actually only one of the many learning differences defined under the term SpLD. It should also be noted that it is rare that an individual will be diagnosed with only one SpLD, as research indicates that individuals are likely to have more than one difference, hence no two individuals are the same. (Alexander-Passe, 2017; DAS, 2019a)

SpLD can impact on an individual's ability to learn and can have a negative impact on the following skills:

- ◆ Attention span
- ◆ Communication Skills
- ◆ Concentration
- ◆ Information processing
- ◆ Lack of Social Awareness (Empathy)
- ◆ Literacy, Numeracy and Oracy
- ◆ Memory, short-term and working memory
- ◆ Motor Skills, gross and fine motor skills
- ◆ Organisation
- ◆ Sense of Direction - left and right confusion
- ◆ Sequencing
- ◆ Time Management

Therefore, SpLD can have a significant impact on an individual's stress, anxiety, and self-esteem. (DAS, 2019a)

DYSLEXIA AND EDUCATION IN SINGAPORE

Research in Singapore by Landulfo, Chandy and Wong (2015), explored the provision for students with dyslexia in the Singapore Education system and made recommendations for education policy change. These were the expansion of support required, calling for an increase in the provision of support services, including the professional development of teachers so that they can better meet the needs of students with dyslexia, additional resources including the use of technology in the classroom and an initiative to increase awareness of learning differences including anti-bullying campaigns (Landulfo, Chandy and Wang, 2015).

Unfortunately, negative educational experiences are reflected by many individuals with dyslexia and they found that educators were unclear on how to support them (Alexander-Passe, 2010, 2016, 2017; Branson, 2017; Foss, 2013; Gallagher, 2014; Gwernan-Jones and Burden, 2009; Hewes, 2015; Langston, 2012; McCabe, 2002; Morris, 2002; Rooke, 2016; Scott, 2004; West, 2005, 2014). Scott (2004), explains that school can damage dyslexic children and the struggle they have in school can be harmful to them.

Recently in an interview, the Singaporean Education Minister, Mr Ong Ye Kung, indicated that the changes to the education system are reflective of Singapore's 'cultural context', that education is highly valued, especially a tertiary education (Ong, 2019). The Singapore Ministry of Education is also making changes to the streaming at the secondary level to subject based banding to reduce stigma and labelling which was associated with streaming (Lim, 2019). As the people of Singapore are its only natural resource, investment in education is highly prized, and therefore the educational achievement of Singaporeans is reflective of its society (Lee, 2011). An article by Weng, Walker and Rosenblatt (2015) on attitudes towards including students with special educational needs, identified that Singapore is classed as a world leader in education. Therefore, it is understandable that firmly held cultural beliefs exist in the attainment of excellence in education, and consequently those who struggle with education and achievement in Singapore have experienced discrimination and stigma, hence, Prime Minister Lee's call for an inclusive society and changing mindsets so all have a role to play in Singapore's future.

EMBRACE DYSLEXIA IN SINGAPORE

In Singapore, in 2014, the "Embrace Dyslexia" movement was initiated to make a conscious shift toward the positive dyslexia movement. The Positive Dyslexia movement was initiated by Rod Nicolson, Tom West, and Brock and Fernette Eide. Embrace Dyslexia aimed to acknowledge the challenges faced in learning by students served by the organisation but to celebrate their strengths too. (DAS, 2019c). As a result, DAS published a book, "A Different Kind of Mind" (Hewes, 2015), with the aim to raise positive awareness about dyslexia. The first story in the book was that of the late Mr Lee Kuan Yew, Singapore's first Prime Minister. Mr Lee revealed he had mild dyslexia in 1996 and, with this announcement, the stigma of having a learning difference was removed, helping to increase the acceptance of dyslexia in Singapore. DAS is ever thankful to Mr Lee, the late DAS President, Dr Jimmy Daruwalla, commented about Mr Lee, "[the] greatest thing he did for us was to remove the stigma". (Wan, 2017, p6).

STRENGTHS AND TALENTS OF DYSLEXIA

The study of the strengths and talents of individuals with dyslexia is abundant. Much of this evidence is as a result of the collection of individual stories of individuals with dyslexia who have been successful in life despite, or in some cases, because of their dyslexia (Alexander-Passe, 2011, 2017; Davis, 1997; Eide and Eide, 2011; Foss, 2013; Gladwell, 2014; Hewes, 2015; Gallagher, 2014; Keiser, 2016; Key, 2018; Langston, 2012; Loncraine, 2004; Malpas, 2017; McNulty, 2003; McCabe, 2002; Morris, 2002; Nicolson, 2015; Olsen, 2007; Rooke, 2016; Shandrow, 2016; Smith, 2008; Sutton, 2012; West, 2005, 2017; Yee, 2019).

The view of positive strengths of dyslexia is something that West (2014) discusses and indicates that one of the greatest paradox is the student *“who appears the most dumb in early years of schooling can be among the most capable and successful later on in the world of work – especially when the work is creative and innovative – involving the ability to think deeply, envision possibilities and see patterns that others do not see”* (West, 2014, p.178)

A recent example of this in Singapore is the story of Edward Yee, an entrepreneur with dyslexia, who defines his success was due to his dyslexia (Lim, 2018). Edward has just been awarded a Rhodes Scholarship to study in Oxford University, the first scholarship awarded in 14 years for a student in Singapore. In his interview with the Today Newspaper, he states, *“I am where I am today because of dyslexia not in spite of it.”* (Lim, 2018).

A literature review was undertaken to explore the talents of entrepreneurs with dyslexia, based on research on the positive attributes and talents of adults with dyslexia. Table 1 reflects the summary of research on talents and attributes of adults with dyslexia.

Table 1. Summary of Talents and Attributes of Individuals with dyslexia.

TALENTS	DESCRIPTION	REFERENCE
Artistic	The ability to create works of art, e.g. Painting, drawing, sculpture.	Chakravarty, 2009; Colgin, 2011; Wolff, 2011
Creativity	The ability to use the imagination to create something original.	Bartlett, Moody & Kindersley, 2010; Everatt, Weeks & Brooks, 2007; Malpas, 2017; Nicolson, 2015; Tafti, Hameedy & Baghal, 2009; Wolff, 2011
Curiosity	A strong desire to know or learn something.	Davis, 1997; Tough, 2013; Vail, 1990
Dynamic Reasoning	Intuition – the ability to solve problems quickly or the vision to anticipate future developments.	Eide & Eide, 2011; Davis, 1997; Vail, 1990
Empathy	The ability to understand and share the feelings of another.	Nicolson, 2015; Malpas, 2017; Tough, 2013; Vail, 1990
Grit	Determination and resolve – the ability to get things done!	Alexander-Passe, 2017; Duckworth, 2016; Kannangara, 2015 Nicolson, 2015; Tough, 2013.

Table 1. Summary of Talents and Attributes of Individuals with dyslexia. (Cont.)

TALENTS	DESCRIPTION	REFERENCE
Growth Mindset	Abilities can be developed through dedication and hard work.	Kannangara, 2015
Innovative Thinking Style	Vision, translating an idea into reality.	Everatt, Steffert & Smythe (1999); Logan, 2009
Interconnected Reasoning	Ability to spot connections, causality, correlation and understanding different points of view, unite information into a "Big Picture" view.	Eide & Eide, 2011; Davis 1997; Nicolson, 2015; West, 2017
Material Reasoning	Spatial Reasoning Ability - to reason about the physical characteristics of objects.	Eide & Eide, 2011; Everatt, Weeks and Brooks, 2007; Everatt, Steffert & Smythe, 1999; Vail, 1990
Narrative Reasoning	Ability to construct, mentally, visual scenes from past personal experiences, create imaginary scenes.	Eide & Eide, 2011; Davis, 1997; Vail, 1990
Non-Verbal Reasoning (Visual Thinking)	Problem-solving using pictures and diagrams. The ability to analyse visual information and to solve problems based on visual reasoning	Davis, 1997; Everatt, Weeks and Brooks, 2007; Malpas, 2017; Nicolson, 2015; Vail, 1990; West, 2005, 2014, 2017.
Proactivity	Thinking ahead to what you must do to put plans into action.	Logan, 2009; Nicolson, 2015; Alexander-Passe, 2017
Resilience	The ability to be unphased under pressure and recovers quickly from difficulties.	Nicolson, 2015; Alexander-Passe, 2017
Teamwork	Ability to work with others effectively to achieve a common goal.	Logan, 2009; Nicolson, 2015;
Vision	The ability to think and plan with imagination and wisdom.	Logan, 2009; Nicolson, 2015; Davis, 1997
Visual-Spatial Ability	The ability to identify visual and spatial relationships among objects.	Attree, Turner & Cowell, 2009; Everatt, Weeks & Brooks, 2007; Nicolson; 2015; Schneps, Rose & Fischer, 2007; Tafti, Hameedy & Baghal, 2009; Vail, 1990; Von Karolyi et al., 2003; West, 2005, 2014, 2017

DEFINING AN ENTREPRENEUR

The Business Dictionary (BD, 2018) defines an entrepreneur as, “someone who exercises initiative by organising a venture to take benefit of an opportunity and, as the decision maker, decides what, how, and how much of a good or service will be produced. An entrepreneur supplies risk capital as a risk taker and monitors and controls the business activities.” Economist, Schumpeter (1883-1950) identified that entrepreneurs strive for distinction through excellence, were highly optimistic, favoured challenges with risk, valued self-reliance and were motivated by profit which they regarded as a way of measuring success (B.D., 2018).

Burns (2016) identifies that entrepreneurs are “good at developing relationships with customers, staff, suppliers and all the stakeholders in business [and] they manage informally... to develop the partnerships and networks that are part of the social capital they create. It enables them to leverage the strategic skills of the partnership” (Burns, 2016, p.7).

Bolton and Thompson (2013) define an entrepreneur, “They are people who create and grow enterprises. They see the world differently to the rest of us and so challenge the status quo. They play a major role in the development of an economy. They know what they want and how to get it” (Bolton & Thompson, 2013, p.11).

Bolton and Thompson (2013), further identify the attributes of an entrepreneur. These seven attributes are described by the acronym – FACETS.

- ◆ **F** – Focus - the ability to stay on target and not get distracted, not procrastinate, and get things done.
- ◆ **A** – Advantage – the ability to select the right opportunity at the right time.
- ◆ **C** – Creativity – the ability to come up with new ideas and translate them into opportunities or solutions.
- ◆ **E** – Ego – Inner ego has good self-esteem, creating confidence and passion. Outer Ego displays the ability to lead and be openly accountable.
- ◆ **T** – Team – the ability to pick the best people, get them working as a team and to know where to go to get help, a network of contacts.
- ◆ **S** – Social – the ability to stand up for a cause and deliver on it.

Entrepreneurial attributes were extracted from the definitions of an entrepreneur and they are collated in table 2.

Table 2. Summary of Entrepreneur Attributes

ENTREPRENEURIAL TRAITS	REFERENCE
Advantage Talent	Bolton and Thompson, (2013)
Challenge the Status Quo	Bolton and Thompson, (2013)
Creativity	Bolton and Thompson, (2013);
Economy Developers	Bolton and Thompson, (2013)
Ego	Bolton and Thompson, (2013)
Focus	Bolton and Thompson, (2013)
Initiative and Innovation	Business Dictionary, (2018), Bolton and Thompson, (2013)
Interpersonal Skills	Burns, (2016)
Mentoring	Bolton and Thompson, (2013)
Opportunistic	Business Dictionary, (2018); Bolton and Thompson, (2013)
Optimistic	Schumpeter, (BD 2018)
Risk-Takers	Schumpeter, (BD 2018);
Self-Reliance	Schumpeter, (BD 2018)
Social	Bolton and Thompson, (2013), Burns, (2016)
Strategists	Burns, (2016)
Teamwork & Relationships	Bolton and Thompson, (2013); Burns, (2016)

In Singapore, Prime Minister Lee, in his 2016 National Day Rally speech talked about promoting entrepreneurship in Singapore and said, “[Entrepreneurs] *give the society confidence. [Entrepreneurs believe] anything is possible... and we need that mindset in Singapore*” (Prime Minister’s Office, 2016).

There has also been amazing growth in business start-ups in Singapore which can be largely attributed to the support from the Singapore Government with matching dollar-for-dollar start-up funding made available for start-up businesses. As a result, 20% of college graduates in 2013 wanted to start their own business in comparison to 10% in 2005 (Weise, 2015).

ENTREPRENEURS WITH DYSLEXIA

Logan’s research into Dyslexic Entrepreneurs explained,

“... they start a business to control the environment around them, do what they are really good at and bring in other people to compensate for what they are not so good at. In the study we found: their ability to delegate, their ability to communicate and harness people behind their vision and, their ability to be very intuitive and to use the right brain skills which many dyslexics have.” (Logan, 2011)

Logan (2011), summarised that thinking differently is a major advantage in the marketplace and dyslexic entrepreneurs using these three abilities were demonstrating how they are different and how they could be successful with their dyslexia.

DEVELOPMENT OF THE SURVEY FOR ENTREPRENEURS WITH DYSLEXIA

To create a survey that considered all the characteristics of those with dyslexia their strengths and challenges and their possible entrepreneurial traits the following figure demonstrates the possible characteristics of an entrepreneur with dyslexia. Figure 1 combines the strengths of adults with dyslexia and traits of an entrepreneur as well as the challenges that someone with a learning difference may face. All these attributes combined demonstrates the possible unique attributes that maybe demonstrated in entrepreneurs with dyslexia.

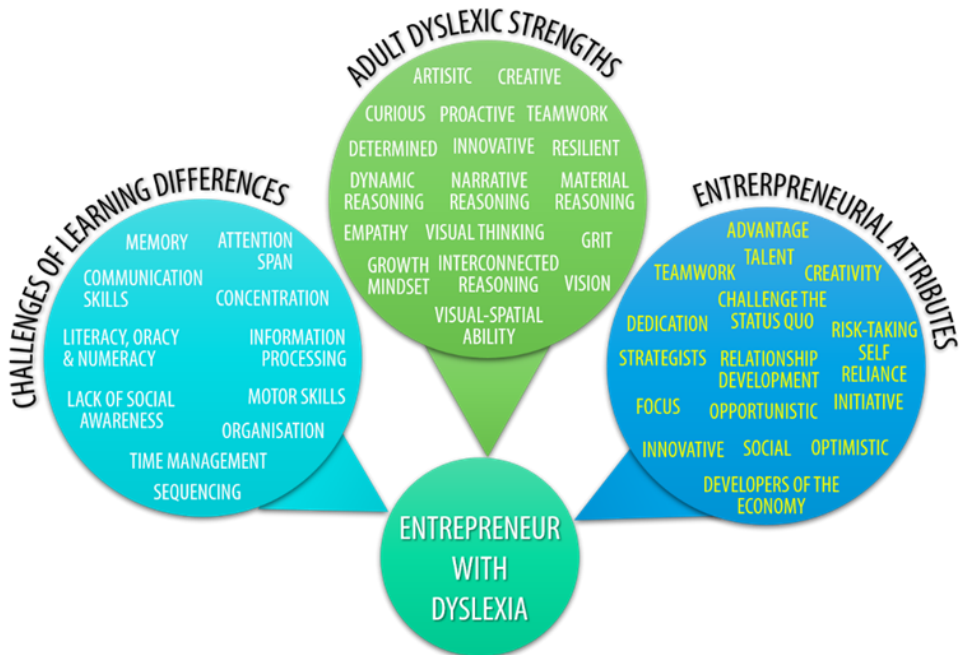


Figure 1. Dyslexic Entrepreneur Attributes

And finally, many entrepreneurs with dyslexia have indicated that the reason they went into business for themselves is the result of difficulties they had at school and their determination to succeed. (Adams, 2016; Alexander-Passe, 2016; Branson, 2017; Bowers, 2007; Field, 2018; Harrington, 2017; Keiser, 2016; Key, 2018; Logan, Hendry Courtney, Brown, 2008; Markowitz, 2011, Shandrow, 2016). The impact of their learning difficulties was the inspiration to succeed.

There is no doubt that entrepreneurs with dyslexia can make a significant contribution to Singapore society. Understanding their educational experiences and their unique attributes will inform policymakers and organisations, like DAS in Singapore, about how to support and nurture them.

The narrative of successful entrepreneurs with dyslexia is a story of positive dyslexia, one that shines the light on how individuals with dyslexia can be successful. It is a story that helps to reduce the stigma of a learning difference and provides hope for those who have been diagnosed with a learning difference as well as hope for their families.

Finally, one of the messages that came from the research into Dyslexic Entrepreneurs in the UK and USA was:

“We have a lot to learn from Dyslexic Entrepreneurs, dyslexia is not a barrier to starting a business and it is a place where dyslexics can really shine!” (Logan, 2011)

METHODOLOGY

Research Design

The research was a mixed method design collecting qualitative and quantitative data in the form of an online survey. The survey was launched in January 2018 on SurveyMonkey for a 12-month period to December 2018.

Participants

Participants were recruited by advertising on Singapore Entrepreneur social media platforms. The advertisement titled, “Are you a Singaporean Entrepreneur? Do you own your own Business?” was promoted for more than 12 months in several media avenues including Facebook and LinkedIn media platforms. An additional search was conducted within LinkedIn on “Founders in Singapore”, and these individuals were sent the survey to complete. More than 1,000 LinkedIn contacts were randomly selected and invited by the researcher to complete the survey.

In total, 125 participants responded to the online survey. Of these only 88 participants were selected for analysis. Those who were not included in the final analysis were largely due to their surveys being incomplete, many chose not to complete the last section of the survey, Adult Dyslexia Checklist. All these participants were contacted by the researcher and were encouraged to fully complete their survey. All participants who completed the survey had indicated that they were business owners.

Survey – Singapore Entrepreneurs

The survey was designed to collect information about the entrepreneur their educational and business experiences, personal attributes including talents, strengths and challenges as well as a score from the Adult Dyslexia Checklist (Smythe and Everatt, 2001). The survey consisted of 85 questions including 5 long answer questions. Most questions asked participants to self-rate their experiences, challenges, abilities and traits. A copy of the survey is in the Appendix.

Informed Consent

Participants were required to read the information about the survey and the research purpose and to provide consent. Participants were advised they could withdraw their response at any time.

Analysis

As the survey was extensive, participants were given the opportunity to review their responses. Therefore, prior to analysis their responses, in the form of a PDF file downloaded from SurveyMonkey, was sent to the participant for verification (Robson and McCarten, 2016). Quantitative data was analysed using Microsoft Excel for Office 365 MSO. Qualitative data was analysed using a thematic code approach (Robson and McCarten, 2016). Where qualitative data was required to categorise information, the content was summarised into codes for further analysis, e.g., factors for becoming an entrepreneur.

Adult Dyslexia Checklist

An Adult Dyslexia Checklist (Smythe and Everatt, 2001), was used to identify participants who may be at risk of having dyslexia or have dyslexic traits. It is important to note that the score from the checklist is not a confirmation or diagnosis and is only an indication that the participant may have dyslexia or a learning difference. This Adult Dyslexia Checklist is currently adopted for use by many organisations, including the Dyslexia Association of Singapore (DAS), the British Dyslexia Association (BDA) (Snowling et al., 2012), and Dyslexic Advantage.

Although the checklist is a simple tool to help identify individuals who may be 'at risk' of having dyslexia, this checklist does not confirm or diagnose dyslexia. Comprehensive testing, including literacy skills, intellectual functioning and behavioural issues must be conducted by a qualified professional to have an official diagnosis of dyslexia or any other SpLD. (DAS, 2019a)

Thirteen participants indicated that they held a diagnosis of dyslexia at the start of the survey. These participants were included in the subsequent analyses as dyslexic irrespective of the results from the Adult Dyslexia Checklist. This decision meant that some of the scores from the checklist for these participants were below the cut-off score of 45, some as low as 30.

RESULTS

The aim of this study is to identify the incidence of dyslexia in the Singapore Entrepreneurial population and to understand their educational experiences as well as identify if there are any unique attributes of these entrepreneurs.

What is the incidence of Dyslexia in the Singaporean Entrepreneurial population?

The data from 88 participants were analysed. The age of the participants ranged from 19 years old to 75 years old, 58 (66%) were male and 30 (34%) were female. Of the 88 participants who were selected for this research analysis, 23 (26%) participants were identified as being in the dyslexic group, this overall finding is similar to the research in the UK by Logan (2009). Of the 23 dyslexic participants, 13 participants (15%) had a formal diagnosis of dyslexia the other 10 (11%) were identified through the dyslexic checklist. Descriptive statistics of participants can be found in table 3.

Analysis of the Adult Dyslexia Checklist was completed to ensure the questions posed in the checklist returned results that were statistically significant between the two research groups. The results, in Table 4, would then provide further validation of the dyslexia checklist and its use in identifying those participants who were to be identified in the dyslexic group.

The Adult Dyslexia Checklist data was analysed by using a single factor ANOVA (analysis of variance) of the 15 questions. 14 questions returned a highly statistically significant result ($p < .001$ and $p < .05$) between the dyslexic and non-dyslexic participants. One question, "Q10. How often do you find creative solutions to problems?" the result between dyslexic and non-dyslexic participants was not significant. Considering the entrepreneurial attributes of the participants for this survey and the qualities attributed to entrepreneurs are creativity, innovation, and inventiveness it is understandable that all participants consider themselves creative problem-solvers (Bolton & Thompson, 2013).

Table 3. Descriptive statistics of participants by age, gender, and dyslexia identifier.

DESCRIPTIVE INFORMATION						
PARTICIPANTS	N	%	MEAN AGE	SD	MIN	MAX
Age	88		38.8	11.684	19	75
Male	58	66%	39.3	12.254	19	75
Female	30	34%	37.9	10.633	20	57
Dyslexic	23	26%	37.0	11.072	19	59
Male	18	78%	36.6	11.703	19	59
Female	5	22%	38.6	9.397	25	51
Non-Dyslexic	65	74%	39.4	11.911	20	75
Male	40	62%	40.6	12.443	21	75
Female	25	38%	37.8	11.035	20	57
ADULT DYSLEXIA CHECKLIST SCORE						
	N	%	MEAN	SD	MIN	MAX
Dyslexic	23	26%	52.652	13.385	30	83
Non-Dyslexic	65	74%	30.108	4.899	22	41

Table 4. Adult Dyslexia Checklist Data and Analysis

SCREENING ITEM	GROUP	N	MEAN	SD	F	P-VALUE
1. Do you confuse visually similar words?	Dyslexic	23	6.696	3.470	51.452	0.000***
	Non-Dyslexic	65	3.277	1.023		
2. Do you lose your place when reading?	Dyslexic	23	5.304	2.566	34.918	0.000***
	Non-Dyslexic	65	2.831	1.318		
3. Do you confuse names for objects?	Dyslexic	23	1.435	0.788	5.481	0.022*
	Non-Dyslexic	65	1.138	0.390		
4. Do you have trouble telling left from right?	Dyslexic	23	1.957	0.976	20.092	0.000***
	Non-Dyslexic	65	1.215	0.545		

Table 4. Adult Dyslexia Checklist Data and Analysis (Cont.)

SCREENING ITEM	GROUP	N	MEAN	SD	F	P-VALUE
5. Is map reading confusing?	Dyslexic	23	2.130	1.217	11.081	0.001***
	Non-Dyslexic	65	1.431	0.706		
6. Do you have to reread paragraphs to understand them?	Dyslexic	23	3.174	0.937	30.611	0.000***
	Non-Dyslexic	65	2.062	0.788		
7. Do you get confused when given several instructions at once?	Dyslexic	23	2.522	1.039	17.454	0.000***
	Non-Dyslexic	65	1.692	0.727		
8. Do you make mistakes when taking down phone messages?	Dyslexic	23	2.652	1.152	43.372	0.000***
	Non-Dyslexic	65	1.400	0.607		
9. Do you find it difficult to find the right words to say?	Dyslexic	23	2.391	1.033	14.424	0.000***
	Non-Dyslexic	65	1.674	0.664		
10. How often do you find creative solutions to problems?	Dyslexic	23	3.348	0.775	1.417	0.237 NS
	Non-Dyslexic	65	3.108	0.850		
11. How easy do you find it to sound out words?	Dyslexic	23	6.000	3.261	56.193	0.000***
	Non-Dyslexic	65	3.000	0.000		
12. When writing, do you find it difficult to organise your thoughts on paper?	Dyslexic	23	5.478	2.274	75.593	0.000***
	Non-Dyslexic	65	2.462	0.985		
13. Did you learn your multiplication tables easily?	Dyslexic	23	5.043	2.477	34.966	0.000***
	Non-Dyslexic	65	2.615	1.317		
14. How easy do you find it to recite the alphabet?	Dyslexic	23	2.043	1.065	40.794	0.000***
	Non-Dyslexic	65	1.092	0.341		
15. How hard do you find it to read out aloud?	Dyslexic	23	2.087	1.041	39.142	0.000***
	Non-Dyslexic	65	1.138	0.390		
TOTAL SCORE	Dyslexic	23	52.652	13.385	135.568	0.000***
	Non-Dyslexic	65	30.108	4.899		

Key *** $p < .001$; * $p < .05$; NS Non-significant

Academic Qualifications

The Singapore Education system has several stages to attain qualifications. It officially commences in Primary School for 6 years for students aged 6 to 12 years old. The qualification at the end of Primary school is the Primary School Leaving Examination (PSLE). The next stage is Secondary school for 4 to 5 years for students aged 13 to 16. The qualification from Secondary school are the General Certificate O Levels (GCE'O). In addition, Secondary school does offer an additional year to extend learning for some students who wish to improve their grades, so they will leave secondary after year 5. Students who graduate from Secondary school can attend Junior College for 2 to 3 years for students aged 16 to 18 years old. The qualifications from Junior Colleges are the A Levels (GCE-A), alternatively after secondary school students can access Polytechnic for 2 to 3 years to access pre-tertiary qualifications at diploma level. Students then move onto Tertiary Education to access university level qualifications (Ministry of Education, 2020).

The highest level of education attainment is summarised in table 5.

Table 5. Highest level of Qualification

QUALIFICATION	HIGHEST LEVEL OF QUALIFICATION							
	DYSLEXIC				NON-DYSLEXIC			
	MALE	FEMALE	TOTAL	%	MALE	FEMALE	TOTAL	%
PRIMARY	1*	0	1	4%	0	0	0	0%
SECONDARY	1	1	2	9%	1	1	2	3%
JUNIOR COLLEGE	0	0	0	0%	5	0	5	8%
DIPLOMA	5	1	6	22%	5	4	9	14%
BACHELORS	8	3	11	48%	22	14	36	55%
MASTERS	3	1	4	17%	5	6	11	17%
DOCTORATE	0	0	0	0%	2	0	2	3%
TOTAL	18	5	23	100%	40	25	65	100%

* This participant went on to vocational school after attending primary school for 8 years. Vocational School experience was not collected as part of this survey; therefore, his highest qualification is reflected as primary school.

Educational Experiences

The education experiences of participants were self-reported on a five-point Likert scale. The scores were calculated from 1 being very positive to 5 being very negative. The lower the mean score the more positive the educational experience reported by the participant. Subsequent analysis was completed by using a single factor analysis ANOVA in Microsoft Excel for Office 365 MSO. The analysis of the educational experience at different education levels by ANOVA can be found in Table 6 below.

Table 6. Educational Experiences of Participants at different school levels

EDUCATION EXPERIENCES						
SCHOOL LEVEL	N	MEAN	SD	DF	F	P-VALUE
PRIMARY SCHOOL (Age 6 to 12)						
<i>Dyslexic</i>	22 ⁺	3.591	1.297	86	36.970	0.000***
<i>Non-Dyslexic</i>	65	2.046	0.926			
SECONDARY SCHOOL (Age 13 to 16)						
<i>Dyslexic</i>	22 ⁺	3.132	1.041	86	18.521	0.000***
<i>Non-Dyslexic</i>	65	2.277	0.922			
JUNIOR COLLEGE (Age 17 to 18)						
<i>Dyslexic</i>	8	3.375	1.302	50	3.646	0.062 NS
<i>Non-Dyslexic</i>	43	2.558	1.076			
POLYTECHNIC (Age 16+)						
<i>Dyslexic</i>	10	1.900	0.876	25	0.012	0.913 NS
<i>Non-Dyslexic</i>	16	1.867	0.640			
UNIVERSITY / TERTIARY (Age 18+)						
<i>Dyslexic</i>	15	1.667	0.488	66	1.102	0.298 NS
<i>Non-Dyslexic</i>	52	1.942	0.978			
OVERALL EDUCATION EXPERIENCE						
<i>Dyslexic</i>	23	2.913	0.949	86	12.971	0.001***
<i>Non-Dyslexic</i>	65	2.138	0.864			

+ One participant could not recall their experiences in Primary school.

^ One participant highest qualification was at the primary school level, he subsequently went to vocational school to learn a trade, Vocational school was not reflected in the survey.

*** $p < 0.001$. NS - Non-significant

Overall Learning Experience

There was a highly statistically significant difference in the overall learning experience between the dyslexic group and non-dyslexic group. The dyslexic group also indicated a more negative educational learning experience compared to non-dyslexics.

Some of the comments from the survey that reflect the overall learning experiences for entrepreneurs who were dyslexic are:

NEGATIVE:

“Being dyslexic, I’m not able to cope with the standard educational curriculums during childhood. Therefore, always not able to cope the teachings.” (Dyslexic – Aged 44)

“...many took advantage...things started going downwards. Name calling, physical bullying ... there was nothing you can do but resist ...once in a while [when] the glass as filled over the brim, all hell breaks loose. Violence, anger, rage ... all these negative emotions, all these burdens was on me because I was looked down upon. In secondary, I thought my life would change but, it was like fate to be bullied for the rest of my years in school. I had lots of voices in my head, to be honest: self-doubts that I was been talked about all the time behind my back, which lead me to seek social gathering to ensure that this talking behind my back won’t happen because the pain was just terrible.” (Dyslexic – Aged 19)

“Very stressful, no matter how hard I tried”. (Dyslexic - Aged 40)

“Struggling constantly, Teachers constantly calling my parents to tell them I wasn’t doing well” (Dyslexic - Aged, 30)

“Struggled... getting worst of worst grades till I gave up trying” (Dyslexic - Aged 35).

POSITIVE

“A positive educational experience, but I could have been given more help overall.” (Dyslexic – Aged 40)

Primary School

There was a significant difference in primary school experience between the dyslexic group and non-dyslexic group, indicating that the non-dyslexic participants had a more positive learning experience in primary school than the dyslexic participants. All participants completed Primary School, four dyslexic participants (17%) indicated that they were retained in Primary school before moving on to Secondary. One dyslexic

participant remained in Primary school and never went to a Secondary school. At the age of 14 he went to vocational school to learn a trade. Some of the comments from the survey that reflect their learning experiences in Primary school are:

"I had a really terrible 3 years from Primary 1-3, which always gotten the last position in class... till my Principal had to speak to my mum, telling her I might be an idiot, best if can send me to see a doctor. My mum cried that day, this moment is still engraved in my heart till now... It's truly a moment of humiliation. (Dyslexic - Aged 44)

For me, primary school was very negative, and I had to attend dyslexic programmes while my classmates attended music or sports... so I always felt that something was wrong with me.... (Dyslexic - Aged 41)

The negative experiences expressed by entrepreneurs with dyslexia have also been described by Scott (2004). Scott described such experiences at school as traumatic and damaging, which seems consistent with several of the views expressed by the participants in the current study.

Secondary School

There was a significant difference in secondary school experience between dyslexic and non-dyslexic participants, indicating that the non-dyslexic participants had a more positive learning experience in secondary school than the dyslexic participants.

One of the comments from the survey that reflect a learning experience in Secondary school is:

"Secondary school was not very positive for me because the learning experience was dull and not very practical. Moreover, there was a lack of technological advancement during that time and teachers were not appreciative of using technology as an educational tool." (Dyslexic - Age 27)

The negative sentiments expressed by dyslexic entrepreneurs about how they learned at school is reflected in the research by Gwernan-Jones and Burden (2009) where it was identified that teacher attitudes towards students with learning differences showed that they did not know or understand how to support their learning. The results here indicate that a review of services provided to Secondary students with dyslexia needs to be reviewed in Singapore.

University

There was no significant difference in the University experience between dyslexic and non-dyslexic participants. Although the mean data for dyslexics indicated a more

positive experience compared to non-dyslexics, this data was not statistically significant.

Some of the comments from the survey that reflect their positive learning experiences in University are:

"[Learning] got really good at University level." (Dyslexic – Age 29)

"In university, my education was focusing not only in knowledge but towards soft skill such as teamwork, leadership, and communication." (Dyslexic – Age 27)

"During my tertiary years though, things changed, I was doing something I loved. ... things that I excelled in, making me constantly at the top of the class, even graduating with a two distinction for my Masters." (Dyslexic – Age 30)

In answer to the question, *"Is learning easier in adulthood than in childhood?"*, 20 out of the 23 (87%) dyslexic participants said it was, compared to only 55% of their non-dyslexic peers. A positive outcome in learning at tertiary level is one of the observations made by West (2014) for dyslexic adults in higher learning.

Inspiration on becoming an Entrepreneur

Participants were asked an open-ended question to discuss their inspiration for becoming an entrepreneur. The qualitative data collected in this section was analysed by using a thematic coding approach (Robson and McCartan, 2016). Reviewing the comments made by participants on the question *"What Inspired you to become an Entrepreneur?"*, answers to this question were grouped by the researcher into different themes. These themes were then summarised further into five thematic codes and were used for analysis. In addition to creating these themes, answers from other questions gave clarity to the thematic code. Answers to questions on the factors for becoming an entrepreneur aided the thematic coding for this question.

Table 7 below reflects the thematic codes used to categorise the information for the inspiration for becoming an entrepreneur.

There were four factors that inspired entrepreneurship from the dyslexic group :

- ◆ **Passion and Vision (26%)** – wanting to make a difference with their business.
- ◆ **Society (26%)** – to make a difference and create an impact on the world.
- ◆ **Control (26%)** – to have control over their own lives.
- ◆ **Dyslexia (22%)** – because of it!

Table 7 -Inspiration to become an Entrepreneur.

INSPIRATION TO BECOME AN ENTREPRENEUR									
THEMATIC CODE	DYSLEXIC	%		NON-DYSLEXIC	%		TOTAL	%	FINAL THEMATIC CODE
Education	0	0%	26%	3	5%	51%	3	44%	Passion and Vision
Business Idea	0	0%		2	3%		2		
Interest in Business	1	4%		2	3%		3		
Passion	1	4%		10	15%		11		
Self-motivated	1	4%		6	9%		7		
Vision	3	13%		10	15%		13		
Control	6	26%	21	32%	27	31%	Control		
Society	6	26%	4	6%	10	11%	Society		
Family	0	0%	7	11%	7	8%	Family		
Dyslexia	5	22%	0	0%	5	6%	Dyslexia		
Total	23	100%	65	100%	88	100%			

Each thematic code is explored below with quotes from the participants with dyslexia:

Passion and Vision

Many participants with dyslexia (26%) described their inspiration to become entrepreneurs as having passion and vision for their ideas. Comments that reflect this choice are below:

"I see there is an opportunity to apply my skillset, which is programming and data analytics, to my industry to solve problems" (Dyslexic – Aged 27)

"I have a passion for storytelling, and I wanted to build on that idea. Telling stories of human interest across the world and bringing these stories to light."
(Dyslexic – Aged 31)

"I saw the lack of impact that academic work was having on real lives. The ideas I had at university had the potential to make a difference and despite the chance to continue academics with a comfortable job, I took the work further than it could have gone." (Dyslexic – Aged 32)

Society

Another significant reason for dyslexic participants to become entrepreneurs was to make an impact on society. A total of 26% of participants with dyslexia reported this reason. Some comments are as follows:

"I think to be a business owner is to take up responsibility of how we can make lives better. How can we become better at what we do, can we change things? Can we do more?" (Dyslexic – Aged 40)

Being a changemaker, it's the best way I can see to create an impact on the world" (Dyslexic – Aged 23)

"I believe that what we do in the company can bring about change"
(Dyslexic – Age25)

"I want to build lives, a chance for people who willing to learn, a chance for people to be their own business owner, improve their lives & family values, brings impartations of my skills to them so that they can be equipped with a survival knowledge (even when next time they are no longer with me)" (Dyslexic – Aged 44)

Dyslexia and Control

Many participants express having control over their own lives, time, and success. 26% of dyslexic participants expressed wanting control. Another 22% expressed that they are in business because of their dyslexia. Both these themes are intricately connected and the following comments about their inspiration to become an entrepreneur, demonstrate this:

"I am not very good with taking orders. I am too head strong and want things done my way" (Dyslexic – Aged 50)

“Wanted freedom and flexibility in my work” (Dyslexic – Aged 36)

“I felt my skills and vision could be better put to use if I was out on my own”
(Dyslexic – Aged 30)

“I am a do’er so I did not wait until someone asked me to do. I just did!”
(Dyslexic – Aged 41)

The following individuals were classified under the Dyslexia theme as they indicated that they were in business because of their dyslexia. They reflected that the desire to be in their own business was to have some level of control over their lives, so because of dyslexia they are in their own businesses which was not expressed by those non-dyslexic entrepreneurs

“Dyslexic! My strength has been helping others to see the big picture, addressing constraints and fore sighting” (Dyslexic – Aged 45)

“[Becoming an Entrepreneur] It was like a drug to overcome my pain in school.”
(Dyslexic – Aged 19)

“I was forced into self-employment – faced many difficulties in data and figures. No understanding from top management about me. I see the bigger picture than many others don’t understand. Others are slow!” (Dyslexic – Aged 58)

“I feel like I didn’t fit anywhere. So, I must have been forced into a corner and wanted to find my own feet.” (Dyslexic – Aged 35)

What are the unique attributes, if any, that distinguish Singaporean Entrepreneurs with Dyslexia?

This section of the survey asked participants to rank their Personal Attributes, Talents, Strengths and Challenges, on a five-point Likert scale from Very High (1), High (2), Average (3), Low (4) and Very Low (5). The lower the score the more positive the participant rated themselves about an item and conversely the higher the score the participant rated themselves less positive about that item. Table 8 reflects the personal attribute data.

The participants completed self-ratings for 33 attributes, but only 6 returned a highly significant difference between the dyslexic and non-dyslexic groups. The first four attributes empathy, interpersonal skills, public speaking and memory ability, the dyslexic group returned self-rating scores that indicated they felt less positive about this trait compared to the non-dyslexic group. It should be noted that the scores, apart from

Table 8. Personal Attributes of Singapore Entrepreneurs

PERSONAL ATTRIBUTES OF SINGAPOREAN ENTREPRENEURS							
ATTRIBUTES		N	MEAN	SD	dF	F	P-value
ARTISTIC ABILITY	Dyslexic	23	2.913	1.505	87	1.764	0.188 NS
	Non-Dyslexic	65	2.508	1.161			
ATTENTION TO DETAIL	Dyslexic	23	2.609	1.270	87	2.462	0.120 NS
	Non-Dyslexic	65	2.169	1.112			
"BIG PICTURE" THINKING	Dyslexic	23	1.391	0.499	87	0.501	0.481 NS
	Non-Dyslexic	65	1.492	0.616			
COMMUNICATION SKILLS	Dyslexic	23	2.604	0.974	87	3.930	0.051 NS
	Non-Dyslexic	65	1.892	0.812			
COMPETITIVENESS	Dyslexic	23	2.000	0.905	87	0.363	0.549 NS
	Non-Dyslexic	65	1.877	0.82			
DECISION-MAKING SKILLS	Dyslexic	23	1.522	0.511	87	2.161	0.145 NS
	Non-Dyslexic	65	1.785	0.800			
DELEGATION ABILITY	Dyslexic	23	1.957	0.706	87	1.441	0.233 NS
	Non-Dyslexic	65	2.185	0.808			
DESIGN ABILITY	Dyslexic	23	2.391	1.196	87	0.191	0.663 NS
	Non-Dyslexic	65	2.508	1.062			
DETERMINATION	Dyslexic	23	1.478	0.665	87	0.012	0.913 NS
	Non-Dyslexic	65	1.462	0.614			
EMPATHY	Dyslexic	23	2.391	1.158	87	8.537	0.004**
	Non-Dyslexic	65	1.754	0.791			
IMAGINATION	Dyslexic	23	1.522	0.665	87	0.227	0.635 NS
	Non-Dyslexic	65	1.600	0.68			
INVENTIVENESS	Dyslexic	23	1.609	0.722	87	1.691	0.197 NS
	Non-Dyslexic	65	1.831	0.698			
INTRAPERSONAL SKILLS	Dyslexic	23	2.087	0.848	87	0.441	0.508 NS
	Non-Dyslexic	65	1.954	0.818			
INTERPERSONAL SKILLS	Dyslexic	23	2.391	1.076	87	7.010	0.010**
	Non-Dyslexic	65	1.846	0.755			
INTUITION	Dyslexic	23	1.826	0.887	87	0.275	0.601 NS
	Non-Dyslexic	65	1.723	0.781			
MEMORY ABILITY	Dyslexic	23	3.217	1.085	87	13.177	0.000***
	Non-Dyslexic	65	2.308	1.014			
MULTI-TASKING ABILITY	Dyslexic	23	2.565	0.992	87	3.645	0.060 NS
	Non-Dyslexic	65	2.108	0.986			

Table 8. Personal Attributes of Singapore Entrepreneurs (Cont.)

PERSONAL ATTRIBUTES OF SINGAPOREAN ENTREPRENEURS							
ATTRIBUTES		N	MEAN	SD	dF	F	P-value
ORGANISATION ABILITY	Dyslexic	23	2.435	0.896	87	1.342	0.250 NS
	Non-Dyslexic	65	2.169	0.961			
PERSEVERANCE	Dyslexic	23	1.739	0.915	87	1.180	0.280 NS
	Non-Dyslexic	65	1.554	0.613			
PLANNING SKILLS	Dyslexic	23	1.870	0.815	87	0.885	0.349 NS
	Non-Dyslexic	65	2.046	0.759			
PROBLEM-SOLVING ABILITY	Dyslexic	23	1.652	0.714	87	0.027	0.870 NS
	Non-Dyslexic	65	1.677	0.589			
PUBLIC SPEAKING ABILITY	Dyslexic	23	2.739	1.175	87	8.579	0.004**
	Non-Dyslexic	65	2.062	0.864			
RESILIENCE	Dyslexic	23	1.739	0.81	87	0.106	0.745 NS
	Non-Dyslexic	65	1.800	0.754			
RISK-TAKING ABILITY	Dyslexic	23	2.261	0.864	87	0.500	0.481 NS
	Non-Dyslexic	65	2.123	0.781			
SELF-CONFIDENCE	Dyslexic	23	2.000	0.674	87	0.139	0.710 NS
	Non-Dyslexic	65	1.938	0.682			
SELF-ESTEEM	Dyslexic	23	1.957	0.706	87	0.126	0.724 NS
	Non-Dyslexic	65	2.016	0.677			
SOCIAL SKILLS	Dyslexic	23	2.217	1.126	87	1.326	0.253 NS
	Non-Dyslexic	65	1.969	0.790			
TEAMWORK & COLLABORATION	Dyslexic	23	2.043	0.825	87	0.256	0.614 NS
	Non-Dyslexic	65	1.954	0.694			
TECHNOLOGY SKILLS	Dyslexic	23	2.043	0.928	87	1.171	0.282 NS
	Non-Dyslexic	65	2.277	0.875			
TIME MANAGEMENT ABILITY	Dyslexic	23	2.217	0.902	87	1.450	0.232 NS
	Non-Dyslexic	65	2.462	0.812			
VISUAL TALENTS	Dyslexic	23	1.652	0.714	87	2.655	0.107 NS
	Non-Dyslexic	65	1.954	0.779			
VISUAL THINKING - 'THINKING IN PICTURES'	Dyslexic	23	1.304	0.470	87	14.963	0.000***
	Non-Dyslexic	65	2.046	0.874			
VISUAL-SPATIAL ABILITY	Dyslexic	23	1.696	0.822	87	6.270	0.014*
	Non-Dyslexic	65	2.200	0.833			

Key * $p < .05$; ** $p > 0.01$; *** $p > 0.001$; NS – Not Significant

memory ability, were still positive scores where the mid score of 3 is neutral. All these scores were before the mid-point. Memory ability (3.2), however, was after 3 for the dyslexic group.

Visual thinking, defined as “seeing ideas and concepts as images”, and visual spatial ability defined as “mentally understand the relationship between objects of space” returned a score that was significantly more positive than the non-dyslexic group, although all participants scored positively, above the mid-point, for these attributes the dyslexic group recorded far more positive scores.

DISCUSSION

The purpose of this study is to gain an understanding of the experiences of Singaporean entrepreneurs with dyslexia and to explore their educational experiences, their attributes, talents, and challenges. Their experiences will help to provide a narrative for those who work with and support dyslexic adults in Singapore.

The current sampling procedure led to 88 entrepreneurs completing the survey. Of these, 26% presented evidence of dyslexia. This is 2.5 times the incidence of dyslexia that would be expected from the general population of Singapore. Although perhaps surprising, this much greater incidence of dyslexia in the entrepreneur population is consistent with other studies (Logan, 2009).

This is exciting news for the dyslexic community in Singapore. Revealing that those with dyslexia have a career pathway in Singapore. As Logan (2011) indicated that “dyslexia is not a barrier to starting a business and it is a place where dyslexics can really shine!” (Logan, 2011). This is a sentiment that we can celebrate in Singapore too!

The researcher would like to acknowledge the Dyslexia Association of Singapore and its late President, Dr Jimmy Daruwalla, in their efforts to bring this knowledge to the dyslexia community and to Singapore. It is also a study that can be built upon and expanded to understand the business experiences of the dyslexic community

However, the significant negative educational experiences reported by the dyslexic entrepreneurs indicate a high level of struggle to succeed and in many cases raises awareness of the challenges they faced in becoming business owners. Prime Minister Lee’s call for an inclusive society will play a role in changing the mindsets of those in education to ensure that all are given the support they need to succeed. (Weng, Walker & Rosenblatt, 2015)

Education Experience of Entrepreneurs with Dyslexia

The lowest level of qualification was at the primary level and this participant was identified as an individual who was diagnosed with dyslexia, having completed an educational psychological assessment in his early 40's by a Singaporean psychologist. The dyslexia screening score for this participant was 81, which classifies the participant as having signs consistent with moderate to severe dyslexia.

The educational experience of entrepreneurs with dyslexia in Singapore reveals that they had a significantly more challenging and highly negative experience in Primary and Secondary school than their non-dyslexic entrepreneurs. This finding suggests that Singapore has a long way to go to ensure that young learners with dyslexia are accepted and supported in Singaporean schools, especially when the youngest dyslexic participant, aged 19, described his education as 'painful' which included physical and mental bullying and being mocked for his lower grades. Another dyslexic participant recounted how humiliated he felt when the Principal of the school indicated to his mother that he was an idiot and needed to see a doctor.

In contrast, the experience had at university by participants with dyslexia was the opposite of this and significantly so. All dyslexic participants who achieved a University education reported the experience was a positive one with no negative reports. This is one of the observations made by West (2014) on the outcomes for dyslexic adults in higher learning that they can shine when learning at tertiary level, 86% of the dyslexic group said that learning was much easier for them as adults. West (2014) indicated that as dyslexic learners mature and study subjects in their area of passion then they have a better educational experience and can be successful in their learning.

The negative experiences of entrepreneurs with dyslexia in Singaporean schools give pause for reflection although this is not a unique issue to Singapore, these sentiments are also expressed elsewhere (Alexander-Passe, 2016; Austin, 2016; Gwernan-Jones and Burden, 2009; Shaywitz, Morris & Shaywitz, 2008; Scott, 2014). Negative experiences in education have implications for the personal development of individuals with dyslexia, (Burden, 2005; Scott, 2014). Burden (2005) also shares that the unfortunate struggles that many dyslexics have in school years does not necessarily mean a failed future and that overcoming these painful and negative experiences builds self-efficacy and positive outcomes. It is therefore important that education policy be reviewed to ensure that individuals with learning differences experience a more positive learning environment in the school system.

Singapore Ministry of Education is currently making significant educational reforms to steer away from testing and streaming with an aim that these initiatives will be conducive to supporting and including a diverse set of learners, in the words of Ong Ye Kung, Singapore's Education Minister, "I hope that within a generation, this culture will

shift to something which is more nurturing, more compassionate” (Teng, 2019). This gives hope that future generations of Singaporeans will not be subjected to the negative experiences that the dyslexic group encountered in their primary and secondary education.

The Singapore government impresses on its people that lifelong learning is essential to improve the skills necessary to meet the evolving needs of an “innovation-driven economy” (Teng, 2016a). Skills based learning is fast becoming a necessity to meet the problems of the future and to meet the changes in job scope. (Huang, 2019). Although these dyslexic entrepreneurs may have had a challenging educational experience this has not been a barrier for their contribution to the Singaporean economy and becoming business owners.

Inspiration on becoming an Entrepreneur

Exploring the factors that inspired dyslexic entrepreneurs to start their own business they indicated that their dyslexia and having control were two of the main reasons for starting their own businesses. To be able to have control over their own circumstances and be in control of their own destiny was a strong theme for non-dyslexic participants too. This is strongly linked to the theme of dyslexia because they needed to be able to have control over what they could contribute to their businesses and find the support of others to complement their weaknesses. A theme that is found in Logan’s research (2009).

Logan (2009) identified that dyslexic entrepreneurs were likely to go into their own businesses to do things their own way and create coping strategies to compensate for their dyslexia. The comments from dyslexic participants in this study reflect this sentiment. However, we see other reasons that Singaporean entrepreneurs are opening businesses and for quite altruistic reasons, too. Giving back to society was a strong theme for dyslexic group and their belief about making a difference and doing good work for Singaporean society was the focus for their business.

Attributes of Entrepreneurs with Dyslexia

Entrepreneurs have unique attributes; 33 attributes and traits were identified for the survey. Most participants rated themselves in the above average range, and there was not a significant difference between the dyslexic and non-dyslexic groups. The analysis revealed six areas of statistical significance in attributes between the two groups, these are:

- ◆ Empathy
- ◆ Interpersonal Skills
- ◆ Public Speaking
- ◆ Memory Ability
- ◆ Visual Thinking- Thinking in Pictures
- ◆ Visual-Spatial Ability

The findings suggested that, compared to their non-dyslexic peers, the dyslexic entrepreneurs reported lower levels of empathy and interpersonal skills, as well as lower self-reported public speaking ability and poorer levels of memory.

The scores for the first three attributes, empathy, interpersonal skills, and public speaking although significantly different from the non-dyslexic population were still positive scores and above the mid-point score of 3. To speculate why the dyslexic group rated themselves lower in these areas may be because of their negative learning experiences. Participants who rated themselves negatively scoring 4 or 5 in these areas had the most challenging times during their education and still struggle with literacy as adults.

The fourth attribute memory ability was also statistically significant. Of all the scores analysed in this section, this score was the only negative score registered with a mean of 3.217. Considered a negative score, this identifies that those with dyslexia have issues with memory and it is an area that can be negatively impacted by a learning difference. (DAS, 2019a)

Visual thinking or thinking in pictures was defined as 'seeing ideas and concepts as images' in the survey. Visual thinking is the ability to analyse visual information and to solve problems based on visual reasoning, a concept that is explored by numerous researchers (Davis, 1997, Everatt, Weeks and Brooks, 2007; Vail, 1990; & West, 2005, 2014, 2017). West (2017), in his latest book, writes that he is often told that individuals with dyslexia, "*could see things that others could not see*" (West, 2017, p14). As a result, West describes this as a hidden talent and advantage for those with dyslexia, with one famous example of the use of visual thinking the employment of dyslexics at the British Electronic Intelligence Agency, GCHQ, where dyslexics are employed because they see things in codes that others do not (West, 2014).

Visual thinking is intimately connected to Visual-Spatial ability, the ability to identify visual and spatial relationships between objects and space, this was defined on the survey as 'mentally understanding the relationship among objects or space'. This ability is measured in psychometric testing when assessments are completed for the diagnosis of dyslexia, and has been found to be one of the strengths reported for dyslexics (Everatt, Weeks & Brooks, 2007). In addition, Vail (1990) identified a number of traits of dyslexics and two were 'awareness of patterns' and 'heightened perception', both of which are likely to be related to increased visuospatial ability. Finally, von Karolyi (2003) concluded that visual-spatial skills can be useful in 'real-world' activities such as mechanical and carpentry skills, artistry, biology, surgery and the interpretation of X-rays and scans (fMRI). Such talents can be argued to provide a much more optimistic future for those with dyslexia.

The profile of dyslexic adults reveals a unique set of attributes and this is reflected in the industries that our Singaporean entrepreneurs with dyslexia are working in. The dyslexic

participants have business in the following industries which leverage on their individual talents and strengths:

- ◆ Advertising and Communications
- ◆ Crafts and Costumes
- ◆ Educational Resources and Design
- ◆ Fashion and Beauty
- ◆ Finance
- ◆ Food & Beverages
- ◆ Information Technology
- ◆ Interior Design, Architectural ancillary services
- ◆ Motion Picture and Video Content
- ◆ Social sector
- ◆ Sport and Exercise
- ◆ Training & Coaching Business

CONCLUSION

The future for Singapore Entrepreneurs with dyslexia is incredibly positive, they have succeeded despite the challenges they have faced in education and have been successful, in some cases because of their dyslexia (Yee, 2018). Individuals with dyslexia should know that to capitalise on their strengths and talents can see them build a career in their own businesses. However, for Singapore to continue to invest in its only natural resource, changes are necessary for the education system to encourage learners with dyslexia to strive for excellence just as much as their non-dyslexic peers. A shift in mindset to skills based rather than academic based measures may see many more opportunities for dyslexics to shine.

Singapore needs to be mindful of the experiences that learners with dyslexia are having in schools, especially Primary and Secondary School, and a review of teacher capabilities at this level would be pertinent at all levels of education (Byrne, 2018; Gwernan-Jones and Burden, 2009; Landolfo, Chandy and Wong, 2015).

LIMITATIONS

A few limitations were experienced in this research. The stigma of a learning difference was highlighted as one concern in Singapore. To ensure the research was ethical it was revealed to participants that two groups of entrepreneurs were being researched, indeed it was important that both cohorts, dyslexic and non-dyslexic participants contributed to this research so that comparisons could be made between both groups. With a stigma of a learning difference being a negative outcome in Singapore it was felt that some entrepreneurs may have decided not to complete the survey as a result. Conversely, as the research advertised that the two groups were being researched then it would be possible that entrepreneurs with dyslexia decided to complete the survey because they were dyslexic.

Survey design became a limitation for a few reasons. The survey was lengthy, a total of 85 questions, and therefore took a long time to complete, this can be a disadvantage for all participants, especially those who did not fully complete the survey. As the survey took approximately 30 minutes to complete and was quite wordy, this also put the dyslexic participants at a disadvantage. It was evident in the 5 long answer questions that non-dyslexic participants provided longer answers than their dyslexic peers.

The thematic analysis was conducted by only one researcher. For thematic coding approaches in research it would be preferable that the coding of the themes be confirmed and validated independently.

RECOMMENDATIONS FOR FUTURE RESEARCH

This research study is the first in Singapore to explore the incidence of dyslexia in the entrepreneur population as well as exploring the educational and business experiences of this population. To continue this research in Singapore, a local adult dyslexia checklist should be created to include the development of current technologies available. It would also be useful to undertake a similar study with a group who had received formal diagnoses of dyslexia.

It was also interesting to note a tendency for Singaporeans to answer positively, perhaps more so than data from other countries would lead us to predict. It would therefore be useful to also examine a non-entrepreneurial group, to ascertain whether this is also indicative of a more generalised Singaporean trait, rather than limited to entrepreneurs.

Further study is required on the business aspects of dyslexics in business. This research gathered significant data on business aspects, however, the results were not sensitive enough to identify trends or differences in the two groups. The survey, therefore, was not an efficient way of collecting data for this area of investigation. It might be appropriate to consider including a focus group or interviews in future research to clarify further aspects of this topic.

One striking aspect of this data was the high level of tertiary education of the participants generally, notably higher than that found in similar studies in the area, which suggests that despite their early struggles, the emphasis on educational attainment has been conducive to success, even for many who struggle with dyslexia. The results of the educational experiences are of significance and with the changes that the Singapore Ministry of Education are currently recommending this would be of interest to organisations such as DAS and how these changes impact those with dyslexia in the changing educational environment in Singapore.

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<h2 style="margin: 0;">SINGAPORE ENTREPRENEURS</h2> <h3 style="margin: 0;">PART 1 — Your Personal and Educational Information</h3>							
PERSONAL INFORMATION : <i>We need to verify the information you provide with you</i>							
NAME:							
EMAIL:							
PHONE:							
AGE:		GENDER:		ARE YOU LEFT-HANDED?		YES / NO	
HAVE YOU BEEN DIAGNOSED WITH A SPECIFIC LEARNING DIFFERENCE? <i>E.g. Dyslexia, ADHD, Dyspraxia, etc</i>						YES / NO	
IF YES, WHAT WAS THE DIAGNOSIS & WHEN WERE YOU DIAGNOSED?							
ACADEMIC QUALIFICATIONS: <i>Please indicate the highest qualifications achieved e.g. Bachelors Degree—Field or Name of Qualification , e.g. "Bachelor of Business and Marketing"</i>							
AT WHAT AGE DID YOU LEAVE FULL TIME EDUCATION?							
EDUCATION AND LEARNING EXPERIENCES:							
What was your school experience like from what you can remember?	Very Positive	Positive	Average	Negative	Very Negative	I Can't Remember	Not Applicable
<input type="checkbox"/> Primary School Experience?							
<input type="checkbox"/> Secondary School Experience?							
<input type="checkbox"/> Junior College Experience?							
<input type="checkbox"/> Polytechnic Experience?							
<input type="checkbox"/> University/Tertiary Experience?							
What was your overall learning experience like?							
Is Learning easier in adulthood rather than childhood?							
PLEASE DESCRIBE YOUR EDUCATIONAL EXPERIENCES.							
<i>If there is not enough space here please feel free to add additional sheets.</i>							

<h2 style="margin: 0;">SINGAPORE ENTREPRENEURS</h2> <h3 style="margin: 0;">PART 2 - Business and Entrepreneurial Information</h3>														
How long have you been a business owner?														
How many businesses do you currently operate?														
How many businesses have you had?														
Do you hold any Patents? <i>(Indicate the number of Patents)</i>														
What are the total number of employees you have been responsible for? <i>(Approx.)</i>														
How do you measure your success in business?														
Do you hold or have been presented with any business awards?														
If yes, what awards do you have?														
PLEASE RATE THE FOLLOWING QUALITIES ABOUT YOURSELF AS AN ENTREPRENEUR	Very Good	Good	Average	Poor	Very Poor									
Success as an Entrepreneur														
Prospect of Future Business Success														
Vision for your Business														
Leadership Skills														
Risk-Taking in Business														
Teamwork and Collaboration														
Self-Esteem and Confidence														
Delegation and using Employee Strengths														
WHAT INSPIRED YOU TO BECOME AN ENTREPRENEUR?														
<i>If there is not enough space here please feel free to add additional sheets.</i>														
PLEASE TICK THE FACTORS THAT HAVE INFLUENCED YOU TO BE A SUCCESSFUL ENTREPRENEUR.														
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> EDUCATION</td> <td style="width: 33%;"><input type="checkbox"/> FAMILY BUSINESS</td> <td style="width: 33%;"><input type="checkbox"/> GOVERNMENT SUPPORT</td> </tr> <tr> <td><input type="checkbox"/> SELF-DRIVEN / MOTIVATED</td> <td><input type="checkbox"/> INVENTION OR IDEA</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> BUSINESS OPPORTUNITY</td> <td><input type="checkbox"/> MENTOR</td> <td>_____</td> </tr> </table>						<input type="checkbox"/> EDUCATION	<input type="checkbox"/> FAMILY BUSINESS	<input type="checkbox"/> GOVERNMENT SUPPORT	<input type="checkbox"/> SELF-DRIVEN / MOTIVATED	<input type="checkbox"/> INVENTION OR IDEA	<input type="checkbox"/> OTHER	<input type="checkbox"/> BUSINESS OPPORTUNITY	<input type="checkbox"/> MENTOR	_____
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<input type="checkbox"/> BUSINESS OPPORTUNITY	<input type="checkbox"/> MENTOR	_____												
PLEASE DESCRIBE WHY YOU CHOSE THESE FACTORS:														
<i>If there is not enough space here please feel free to add additional sheets.</i>														

SINGAPORE ENTREPRENEURS					
PART 3 - Your Personal Attributes - Talents, Strengths and Challenges					
HOW WOULD YOU RATE YOUR TRAITS, ABILITIES AND SKILLS	Very High	High	Average	Low	Very Low
Artistic Ability: <i>Create works of art, e.g., painting, drawing, sculpture etc.</i>					
Attention to Detail: <i>To be thorough and accurate when completing tasks.</i>					
"Big Picture" Thinking: <i>Sees total solutions for problems, "out-of-the-box" thinking.</i>					
Communication Skills: <i>Ability to communicate ideas effectively to others.</i>					
Competitiveness: <i>Having a strong desire to compete and succeed</i>					
Decision-making Ability: <i>Being able to make decisive and effective decisions.</i>					
Delegation Ability: <i>Able to delegate tasks to others who have the skills to do them better.</i>					
Design Ability: <i>Able to design unique products, create unique visual designs.</i>					
Determination: <i>Having a firmness of purpose, resolve and persistence to get things done.</i>					
Empathy: <i>The ability to understand and share the feelings of others.</i>					
Imagination: <i>Being able to form ideas, concepts, a creative ability to see things with the mind.</i>					
Inventiveness: <i>Being able to see and create unique solutions to problems.</i>					
Intrapersonal Skills: <i>Understanding self in relation to others.</i>					
Interpersonal Skills: <i>Interacting with others effectively.</i>					
Intuition: <i>The ability to understand something instinctively without the need for reasoning.</i>					
Memory Ability: <i>The ability to store, retain and recall information effectively.</i>					
Multi-tasking Ability: <i>The ability to manage multiple tasks effectively.</i>					
Organisation Ability: <i>Organising work and time schedules and prioritising tasks effectively.</i>					
Perseverance: <i>Persistence in doing something despite difficulty or delay in achieving success.</i>					
Planning Skills: <i>Implementing actions and decisions to accomplish goals.</i>					
Problem-Solving Ability: <i>Analytical and critical thinking skills help you to evaluate a problem.</i>					
Public Speaking Ability: <i>Engages, Entertains and informs audiences to deliver a message.</i>					
Resilience: <i>The capability to recover quickly from difficulties and hardship.</i>					
Risk Taking Ability: <i>Engaging in activities that may result in failure than assured success.</i>					
Self-Confidence: <i>Trusting your abilities, qualities and judgements.</i>					
Self-Esteem: <i>A positive belief in yourself, your abilities and your future.</i>					
Social Skills: <i>Getting on with and understanding others.</i>					
Teamwork and Collaboration: <i>Working together effectively for a shared goal.</i>					
Technology Skills: <i>Use of Assistive Technology and other technology solutions to succeed.</i>					
Time Management Ability: <i>The ability to use one's time effectively or productively.</i>					
Visual Talents: <i>Seeing patterns of things, or the whole thing, that others may not see.</i>					
Visual Thinking - "Thinking in Pictures": <i>Seeing ideas and concepts as images.</i>					
Visual-Spatial Ability: <i>Mentally understand the relationship among objects or space.</i>					

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PART 4—Adult Dyslexia Checklist

Even if you have a diagnosis of Dyslexia please completed this section

ADULT DYSLEXIA CHECKLIST

Below are the questions that were found to be more predictive of dyslexia (as measured by prior diagnosis). In order to provide the most informative checklist, scores for each answer indicate the relative importance of that question. Alongside each line you can keep a tally of your score and at the end find a total. For each question, circle the number in the box which is closest to your response.

<i>Please circle the number in the box closest response.</i>	Rarely	Occasionally	Often	Most of the time	Total
Do you confuse visually similar words such as cat and cot?	3	6	9	12	
Do you lose your place or miss out lines when reading?	2	4	6	8	
Do you confuse the names of objects, for example table for chair?	1	2	3	4	
Do you have trouble telling left from right?	1	2	3	4	
Is map reading or finding your way to a strange place confusing?	1	2	3	4	
Do you re-read paragraphs to understand them?	1	2	3	4	
Do you get confused when given several instructions at once?	1	2	3	4	
Do you make mistakes when taking down telephone messages?	1	2	3	4	
Do you find it difficult to find the right word to say?	1	2	3	4	
How often do you think of creative solutions to problems?	1	2	3	4	
	Easy	Challenging	Difficult	Very Difficult	
How easy do you find it to sound out words such as el-e-phant?	3	6	9	12	
When writing, do you find it difficult to organise thoughts on paper?	2	4	6	8	
Did you learn your multiplication tables easily?	2	4	6	8	
How easy do you find it to recite the alphabet?	1	2	3	4	
How hard do you find it to read aloud?	1	2	3	4	
TOTAL SCORE					

RESULTS FROM THE ADULTS TEST - WHAT IT ALL MEANS

The research and development of the checklist has provided a valuable insight into the diversity of difficulties and is a clear reminder that every individual is different and should be treated and assessed as such. However, it is also interesting to note that a number of questions, the answers to which are said to be characteristics of dyslexic adults, are commonly found in the answers of non-dyslexics.

It is important to remember that this test does not constitute an assessment of one's difficulties. It is just an indication of some of the areas in which you or the person you are assessing may have difficulties. However this questionnaire may provide a better awareness of the nature of an individual's difficulties and may indicate that further professional assessment would be helpful.

Whilst we do stress that this is not a diagnostic tool, research suggests the following about your total score: *(see next page)*

SINGAPORE ENTREPRENEURS

PART 4 Adult Dyslexia Checklist Results

SCORE LESS THAN 45 - PROBABLY NON-DYSLEXIC

Research results: no individual who was diagnosed as dyslexic through a full assessment was found to have scored less than 45 and therefore it is unlikely that if you score under 45 you will be dyslexic.

SCORE 45 TO 60 - SHOWING SIGNS CONSISTENT WITH MILD DYSLEXIA

Research results: most of those who were in this category showed signs of being at least moderately dyslexic. However, a number of persons not previously diagnosed as dyslexic (though they could just be unrecognised and undiagnosed) fell into this category.

SCORE GREATER THAN 60 - SIGNS CONSISTENT WITH MODERATE OR SEVERE DYSLEXIA

Research results: all those who recorded scores of more than 60 were diagnosed as moderately or severely dyslexic. Therefore we would suggest that a score greater than 60 suggests moderate or severe dyslexia. Please note that this should not be regarded as an assessment of one's difficulties. But if you feel that a dyslexia-type problem may exist, further advice should be sought.

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Other Dyslexia Screening Tests can be found at these websites:

British Dyslexia Association—Adults and Employment
www.bdadyslexia.org.uk/about-dyslexia/adults-and-business.html

International Dyslexia Association—Adults Self-Assessment Tool
www.interdys.org/AreYouDyslexic_AdultTest.htm

National Centre for Learning Disabilities
<http://www.ncl.org/learning-disability-resources/checklists-worksheets/interactive-ld-checklist>

The Dyslexia Association of Singapore (DAS) is currently working towards a programme that will provide support for Adult Dyslexics, if you need further information we recommend the information on adult dyslexia support from our international dyslexia partners:

International Dyslexia Association: www.interdys.org
 British Dyslexia Association: www.bdadyslexia.org.uk

If, after completing this checklist, you would like to talk to DAS about an Adult Assessment

Please contact DAS at: 6444 5700

THANK YOU FOR COMPLETING THIS SURVEY

I will be in contact with you soon to verify this information with you and to answer any questions you may have about this research.

Deborah Hewes, email: deborah.hewes@das.org.sg