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Dyslexia in the Malay Language in Singapore

Hamadatun Najwa bte Yusuf Wahbi[1*]

1. *Dyslexia Association of Singapore*

Abstract

This study investigated the difficulties faced by English-Malay bilingual learners with dyslexia. The purpose of the study was to have a better understanding of the difficulties faced by bilingual learners with dyslexia in acquiring the Malay language, particularly in the aspect of reading and reading comprehension. Secondly, the study aimed to gain a deeper understanding of Malay as a second language in learners with similar profiles.

Inductive analysis revealed that word reading difficulties were affected by unfamiliarity of words, increasing word length and complexity of syllables and affixed words. Challenges in reading comprehension were due to poor word vocabulary and long comprehension passages. Additionally, the perceived usefulness of the Malay language as an alternative language for communicating with members of the community, as well as feeling supported in the classroom were the underlying motivating factors to learn the language.

These findings suggest that in teaching learners of this unique profile, phonological knowledge and morpheme instruction can facilitate reading in the Malay language. The length and lexical level of a given passage is also a factor to take into account when assigning tasks in the classroom. Finally, the esteem and anxiety levels must be considered for these English-Malay bilingual learners with dyslexia to maintain interest and motivation to learn Malay as a second language in Singapore.

Keywords: dyslexia, English, Malay, Singapore, bilingual

* *Correspondence to:*
Hamadatun Najwa Yusuf Wahbi, Senior Educational Therapist, Dyslexia Association of Singapore
Email: hamadatun.yusuf@das.org.sg

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1. INTRODUCTION

1.1 Singapore's Multilingual Society

Singapore's linguistic scene creates a rather complex path in language learning among students in the country. The multilingual society has four official languages: English, Mandarin, Malay, and Tamil, with English as the lingua franca and the language of the curriculum in schools. The English language was promoted as the language essential for international business, diplomacy and technology (Dixon, 2003; Bolton & Ng, 2014; Sim, 2020). It was also to promote cohesion between the different ethnic groups, allowing them to communicate with one another in a common language. On top of learning English, students are required to learn their home or ethnic language, Mother Tongue language (MTL), according to the Bilingual Policy, where one's MTL is dependent on one's ethnic group: Mandarin for the Chinese community, Malay for the Malay community, and Tamil for the Indian community. Learning one's MTL served as a gateway to learning one's heritage, safeguarding Asian identities, and preserving the respective ethnic cultures. The policy also seeks to provide students a competitive edge when pursuing global and regional prospects in the future (Ministry of Education, 2020). With MTL learnt as an additional subject in schools, students in Singapore are thus bilingual and bi-literate (Bolton and Ng, 2014; Zhang, Chin and Li, 2017). On top of being a compulsory subject to learn, proficiency in MTL is also assessed; this applies to primary schools through to pre-university institutions. At the primary level, MTL is one of the 4 subjects assessed in the Primary School Leaving Examination (PSLE), the national examination taken by all students in Singapore primary schools in the final year of their primary education. Thus, how well a student performs in the MTL subject will directly contribute to their overall PSLE score.

1.2 Dyslexia in Singapore

Learners with dyslexia, making up 3% to 10% of the student population (Ministry of Education, 2021a), are amongst those who face the brunt of the linguistic demands brought forth by these requirements and policies. Dyslexia is a learning difficulty of neurobiological origin that affects one's reading and spelling ability (International Dyslexia Association, 2022), where learners exhibit challenges in aspects of literacy, including word decoding, reading accuracy, reading fluency and reading comprehension (Ziegler et al., 2003; Ziegler and Goswami, 2005; Snowling, 2013). English language has been found to be complex in nature, owing to its orthography and phonological structure (Seymour et al., 2003; Ziegler et al., 2003). As such, the fact that English is the medium of instruction in Singapore schools already presents itself as a challenge for learners with dyslexia.

Current psychological assessments to diagnose dyslexia involve standardised tests in the English language, with remediation support primarily in the English language. With the

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spotlight being on English-learning support for dyslexia, the other national languages have received little attention. In fact, in learners with dyslexia, second language acquisition as a means of maintaining competence in bilingualism and bi-literacy may compound language learning difficulties even further (Crombie, 2000; Andreou and Segklia, 2017).

1.3 Malay Language in Singapore

Furthermore, Singapore has been experiencing an overall language shift to English over the years (Singapore Department of Statistics, 2020). The recent statistics from Singapore's General Household Survey showed that by 2020, English was the predominant language spoken at home for 48.3 percent of the resident population aged 5 and above (Singapore Department of Statistics, 2020). According to the recent census, even the community that showed the most resilience against the language shift, has begun to succumb. Specifically, the Malay community that makes up approximately 13.5 percent of Singapore's ethnic composition (Singapore Department of Statistics, 2020, p. x.), has shown a 22 percent rise in the population shifting from speaking mainly Malay at home to predominantly English. This is the steepest rise observed compared to the other languages (Singapore Department of Statistics, 2020).

For the population aged between 5 and 14 years, only 3 percent indicated Malay as the only language spoken at home, as the majority were English-Malay bilinguals, notably 57 percent spoke predominantly English and 34 percent spoke predominantly Malay (Singapore Department of Statistics, 2020, p. 158). One may expect this trend to continue in the upcoming years. In a bid to counter the language shift and uphold the effectiveness of the Bilingual Language policy, in 2015 the Ministry of Education (MOE) announced that $25million was budgeted for the 3 Mother-Tongue Language committees to continue to promote and enhance the learning of MTL (Ministry of Education, 2015). Malay Language was no exception. Efforts included implementation of Bulan Bahasa (Malay Language Month) celebrated annually, to celebrate with the community while instilling a sense of appreciation for the Malay language (Majlis Bahasa Melayu Singapura, 2022).

1.4 Dyslexia in Malay in Singapore

The Malay language is of sharp contrast to English, in that it's orthographic and phonological nature is relatively easier to acquire (Winskel and Widjaja, 2007; Lee, Low and Mohamed, 2013; Zhang, Chin and Li, 2017). Despite this, Malay language support was recently offered under the Mother Tongue Support Programme, an early intervention programme recently rolled out in 2021 across all schools for Primary 3 and Primary 4 students who needed more support in their respective MTL (Ministry of Education, 2021b). Little has been said about the details of MTSP since its launch in 2021. However, what is known is that class sizes are smaller than the main classroom, and foundational skills in

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oracy and literacy is the main focus of the programme (MOE, 2021b). This suggests that there are indeed learners who face challenges in Malay, even midway through their elementary years. The Malay Language curriculum taught in primary schools focuses on 'listening, speaking, reading, writing and interaction skills' and are offered at 2 proficiency levels: Foundation Malay and Standard Malay (MOE, 2020b). Students who are struggling to cope with the standard curriculum could opt for Foundation Malay instead, although the marks are being scaled down prior to adding to the overall score (Wong, 2019). For the newly implemented scoring system introduced in 2021, subjects are scored based on 8 bands called Achievement Levels (AL), with AL 1 being the highest score and AL 8 being the lowest. Scores for Foundation subjects will be mapped to the lowest 3 levels of the scoring system, which is AL 6 to AL 8. This means that while a student may score full marks for the Foundation Malay paper, the highest attainable level would be an AL 6 (MOE, 2021c). A student may also be exempted from taking a Mother Tongue Language if a child has had specific learning difficulties that impeded their learning. In this case, the child would be assigned an MTL score between AL6 and AL8.

Ms Indranee Rajah, then Second Minister of Education, mentioned at a Parliamentary meeting in 2019, that 70% of students with special educational needs in mainstream schools take MTL at PSLE, and that an average of 4.5% of students were exempted from taking MTL (Ang, 2020). However, the proportion of students exempted from Malay was not specified, and neither were the details on the specific learning difficulty. Based on this, it is presumable that learners with dyslexia may be amongst those taking MTL at foundation level in primary school or considering MTL exemptions. They may also stand to benefit from the additional support of MTSP.

1.5 Research Aims and Questions

Despite Malay being offered at different proficiency levels to accommodate to students' varying abilities and learning needs, the emphasis on bilingualism and the linguistic expectation puts learners with dyslexia at a disadvantage. Furthermore, implications on learning Malay considering the unique profile of having dyslexia and being English-Malay bilingual in the context of Singapore has not been widely studied. This gives impetus for research in the difficulties faced in acquiring the Malay language amongst this group of learners.

The research study had two aims:

- to understand how dyslexia is manifested in the Malay language among bilingual learners in the aspect of reading and reading comprehension
- to deepen the understanding of second language acquisition amongst learners with similar profiles

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The following three questions guided this study:

1. What are the reading difficulties faced amongst bilingual learners with dyslexia?

2. What are the challenges faced when comprehending texts?

3. What are perceptions and motivations towards learning Malay?

Findings from this research may act as a catalyst to modify the existing pedagogical approach that is currently being practised in schools, whether it is for a future MTSP programme that supports beyond Primary 4, or for Malay language teachers in the main classroom.

2. LITERATURE REVIEW

2.1 Theories of Dyslexia

Stages of Reading Acquisition

The development of reading acquisition involves metalinguistic awareness, the ability to manipulate the linguistic units of a particular language (Nagy and Anderson, 1995). Essentially, early stages of reading start with understanding print to speech mapping and how sounds are being represented as symbols in a particular language (Nagy and Anderson, 1995; Zhang, Chin and Li, 2017). This is referred to as the logographic stage of reading (Stuart and Coltheart, 1988; Frith, 1985; Seymour, 1984). Phonological awareness is one type of metalinguistic awareness that has been found to play an important role in early stages of reading (Nagy and Anderson, 1995), which involves associating graphemes and phonemes to one another. This is the second stage of reading acquisition according to Seymour's theory, the alphabetic stage (Stuart and Coltheart, 1988). The orthography and phonography of a particular language determines whether small grain-size units (phonemes) or large grain-size units (syllables) are decoded for word reading (Ziegler and Goswami, 2005; Zhang, Chin and Li, 2017).

The final stage of reading according to Seymour is the orthographic stage, which involves orthographic and lexical functions to read words (Stuart and Coltheart, 1988). At this stage, morphological awareness, another type of metalinguistic awareness, also contributes to word reading. This refers to being able to manipulate the smallest unit of meanings (morphemes) and the morphological constituents in a word (Carlisle, 2003). Furthermore, according to Gough & Tunmer's Simple View of Reading (Florit and Cain, 2011; Snowling, 2020; Gough & Tunmer, 1986), reading comprehension is dependent on both decoding and linguistic comprehension. In other words, being able to comprehend texts is attributed to one's ability to decode the words and process aurally presented

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information in a particular language, and difficulty in any of the two areas will lead to reading comprehension difficulties (Florit and Cain, 2011).

Dyslexia is a learning difficulty in which the phonological deficit hypothesis has been predominantly used to understand the underlying cause (Snowling, 2013). The hypothesis suggests that the difficulties faced by learners with dyslexia is attributed to phonological deficits, which affects the ability to map letters to their corresponding sounds, thus impeding their ability to perform tasks that require phonological processing (Liberman et al., 1974; Ehri et al., 2001). Phonological awareness, that is one's ability to manipulate the sounds of speech at different levels (e.g. phonemes, syllables, rimes) has been extensively researched in the past and has shown to play a causal role in acquiring reading skills in an alphabetic orthography (Liberman et al., 1974; Wagner and Torgesen, 1987; Ehri et al., 2001; Winskel and Widjaja, 2007). Thus, problems in this aspect are indicators of reading difficulties, in which the ability to decode pseudo-words (i.e. grapheme-phoneme mapping rules without context) has been highly regarded as the main indicator.

Furthermore, in English older children, morphological awareness has also shown to play a role in reading and spelling acquisition (Carlisle, 2003; Winskel and Widjaja, 2007). In learners with dyslexia, Frith concluded that there is discontinuity between the stages of reading, and challenges in mastering one stage will result in difficulties advancing to the next stage (Frith, 1986). Thus two subtypes of dyslexia can occur, according to Frith: classic dyslexia and classic dysgraphia, where the former refers to poor mastery in the alphabetic stage, and the latter refers to poor mastery at the orthographic stage (Frith, 1986). Learners with dyslexia have shown that in tasks where phonological or lexical skills are not the focus (such as digit strings), they exhibit deficits in processing letter strings (Boros et al., 2016; Ziegler et al., 2010).

Temple and colleagues (2001) found impairments in the brain of learners with dyslexia in the aspect of orthographic processing too, particularly single letter processing. This had also been explained as deficits in visual attentional processing, where they show poor performance in visual search tasks, whether it involved letters, digits, or symbols. (Boros et al., 2016). Other bodies of research have raised concerns regarding phonological instruction only improving reading accuracy, but having little effect on reading fluency and reading comprehension (Wolf and Bowers, 1999; Landerl and Wimmer, 2000; Snellings et al., 2009). Wolf and Bowers (1999) found that processing speed was impaired in learners with dyslexia, specifically in the aspect of rapidly naming symbols involving language stimuli (e.g. letters, numbers objects). They coined this a double-deficit, in which naming speed was a second deficit in learners with dyslexia, and together with a phonological deficit, a learner with dyslexia would face significant challenges in reading (Wolf and Bowers, 1999).

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2.2 Impact of dyslexia on reading acquisition in different language structures

Past studies have confirmed how both orthography and phonology of a language determine the incidences of reading difficulties and the degree of the severity (Ziegler and Goswami, 2005). Seymour and colleagues' (2003) hypothetical classification of European languages was built on the dimensions of orthographic depth and syllabic complexity. Orthographic depth resembled the consistency of letter-phoneme mapping in a language. A shallow orthography had letters mapped to phonemes consistently, while a deep orthography contained inconsistent letter-phoneme mapping and complexities that included morphological effects and multi-letter graphemes (Seymour et al., 2003). Syllabic complexity in a language referred to the predominance of open or closed syllables in a language, and the positions in which consonant clusters appeared (Seymour et al., 2003). The authors hypothesised that reading acquisition was achieved more rapidly in languages of simple syllabic structure and shallow orthographic depth, while development was slower in languages with complex syllabic structure and deep orthographies (Seymour et al., 2003).

In reading shallow orthographies, there has been little emphasis on the effect of phonological deficits in reading acquisition, as reading accuracy scores have been shown to be high or comprising minimal errors (Ziegler et al., 2003; Ziegler and Goswami, 2005; Marinus and de Jong, 2010; Dandache, Wouters and Ghesquière, 2014). One example is a study by Milankov and colleagues (2021) on the consistent Serbian language. They found that reading difficulties in their participants were manifested as slow phonological decoding, which resulted in reading speed deficits, as opposed to reading errors (Milankov et al., 2021). On the contrary, other studies have found that both phonological deficits are evident, on top of reading speed deficits, amongst learners with dyslexia, regardless the orthographic depth of the language. This was seen in Boets and colleagues' (2010) longitudinal study on Dutch-speaking children with dyslexia. The authors attributed the disparity with past studies to the measures they had used in their study – that they were sensitive measures, and were thus able to reveal deficits in both phonological and, in turn, reading deficits. This was in spite of Dutch having medium orthographic depth (Seymour et al., 2003). This was in line with another study comparing reading difficulties in German and English (Ziegler et al., 2003), even though Seymour (2003) classified German being of shallow orthography.

Reading errors were seen across both languages, although they were relatively higher in the English language, due to its inconsistent orthography. Relevant to note, however, is that in both languages, phonological deficits surfaced when reading non-words in either language and that the significant size of the non-word reading deficit across the two were similar (Ziegler et al., 2003). Eklund and colleagues (2015) did a study on the transparent Finnish orthography in students in Grade 2, 3 and 8. Their findings on word reading accuracy revealed high scores and minimal errors, consistent with earlier findings (Ziegler et al., 2003; Ziegler and Goswami, 2005; Marinus and de Jong, 2010;

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Dandache, Wouters and Ghesquière, 2014). However, similar to Ziegler (2003), non-word reading accuracy resulted in low scores. It is worth pointing out that this was not only seen in the participants in Grades 2 and 3; the students in Grade 8 exhibited this too. These studies give insight to the persistent difficulties in phonological decoding that are subject to the demands of a task when tasks are perceived to be more challenging (Eklund et al., 2015). The fact that difficulties were faced in the older learners is notable, as past studies have found that the reliance on grapheme-phoneme mapping may no longer be the decoding strategy as one's reading skills develops (Borleffs et. al, 2019; Landerl & Wimmer, 2008; López-Escribano & Katzir, 2008, Tressoldi et. al., 2001).

In reading acquisition, the role of syllables in word recognition is another aspect of reading that may affect one's ability to acquire a language, as the complexity of a syllable varies between languages. A study by Seymour and colleagues (2003) revealed that one's ability to decode non-words was subject to the syllabic complexity, while real word and pseudo-word reading depended on the depth of the language. They concluded that these two aspects – syllabic complexity and orthographic depth – determined the rate at which language was acquired. They hypothesized that the difficulties acquiring a language will increase as syllabic structures got complex, and as orthographies got deeper. Verhoeven and Keuning's findings (2018) on children with dyslexia in the intermediate grades learning the Dutch language found that significant errors in word decoding accuracy were observed, particularly as the word length increased. However, in decoding pseudo-words, the participants were inefficient in decoding both long and short pseudo-words (Verhoeven and Keuning, 2018), and this was especially so when they encountered digraphs (Marinus and de Jong, 2010). Several researchers have attributed the complexity of a syllable to the consonant clusters in words, of which the problems varied depending on the position of the clusters in a word. Ziegler's study (2003) found that even after initial complex onsets (like consonant clusters) were excluded from tested words, both English and German learners with dyslexia displayed length effects, where reading longer words (both real and non-words) was found to significantly affect their reading speed, due to considerable effort and time spent on decoding each letter as words increased in length (Ziegler et al., 2003).

Research has shown that the morphological structure of the language is a contributing factor in the reading process, where developing readers will rely on their knowledge of morphemes when processing pseudo words or words with morphologically complex structure (Borleffs et. al. 2019). Some researchers have argued that it is morphological awareness, and not phonological awareness, that is required for reading new and longer words (Quémart, Casalis and Colé, 2011), and continues to develop as one progresses across upper primary school years and beyond (Berninger et al., 2010). This is more so in learners with reading difficulties where their reading would otherwise be slow (Suárez-Coalla and Cuetos, 2013). There have been few studies conducted in the aspect of dyslexic learners. One case was done on a deeper orthography that is French, by Quémart, Casalis and Colé (2011). They found that learners with dyslexia relied on

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their morphological awareness to facilitate visual word recognition. However, compared to the typical readers, they were found to be impaired in tasks that required the use of morphological knowledge, notably in the absence of context cues. Traficante and colleagues (2011) found that Italian learners with dyslexia were able to identify morphemic units to aid the reading of pseudo-words. However, in orthographic sequences without morphological structures, the learners with dyslexia achieved a low level of reading accuracy. In comparing these findings, worth noting is that French has a deep orthography (Seymour et al., 2003), thus the difficulties in morphological processing could be attributed to the opacity of the language. As for Italian, it is of rather shallow orthography and not agglutinative in nature, which means a word may not comprise of several morphemes or may not be morphologically complex, resulting in easier decoding.

With word recognition being subject to the syllabic and morphological structure of the words, on top of an underlying phonological deficit in learners with dyslexia, it is logical to expect difficulties in reading comprehension. Studies have highlighted the role of morphological awareness in reading comprehension (Carlisle, 2000, 2003; Singson, Mahony and Mann, 2000). Being able to process the morphemes in a word can allow learners to easily draw its meaning and the syntax when found in a sentence (Carlisle, 2003), thus contributing to reading comprehension, more so as words get more complex beyond lower elementary grades (Kuo and Anderson, 2006). Furthermore, morphological knowledge helps learners develop vocabulary (Anglin, 1993; McKeown and Curtis, 2014).

The concern on whether or not students were able to recognise morphemes in a morphologically complex words and derive meaning from it was discussed in Carlisle's commentary (2003). She cited Tyler and Nagy's findings (1990) where weak readers were found to make more syntactic errors than better readers (Carlisle, 2003). Nagy and Anderson (1984) suggested that learners who are sensitive to the morphemes in a word may be able to employ their morphological processing skills when building vocabulary. This implies that learners acquiring a morphologically-rich language may be advantaged due to their earlier years of developing morphological awareness, possibly facilitating vocabulary acquisition and reading comprehension in learners with dyslexia, as seen in Bertram, Laine, and Verkalla's study (2000).

In the case of more transparent orthographies, Zarić and Nagler (2021) found that in their study on weak readers in the German language, reading comprehension at sentence level was not only dependent on phonological processing and naming speed, but also orthographic knowledge. However, the authors noted that the participants displayed a primary reliance on using word-specific knowledge here, whereas application of general orthographic knowledge was only employed when they encountered uncommon words (Zarić and Nagler, 2021). However, this was not the case for reading comprehension at text level (Zarić and Nagler, 2021) where the phrases and sentences integrate information and ideas (Castles, Rastle and Nation, 2018). In this

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aspect, the participants were found to mainly rely on phonological knowledge (Zarić and Nagler, 2021).

This was consistent with findings from Constantinidou and Stainthorp's study (2009) in Greek-speaking children, where poor decoding skills and, in turn, poor fluency were revealed to compromise the text-level reading comprehension among weak readers. In agglutinative languages like Finnish, Torppa and colleagues (2012) associated poor reading fluency to weak reading comprehension. In a study comparing dyslexic and typical readers in French, Casalis and colleagues (2004) found that the children with dyslexia made more errors in the reading comprehension task that required application of syntactical and semantic skills.

The results also revealed that the learners with dyslexia struggled in tasks that required them to use context cues to complete sentences with derived words; this was observed to be more challenging than identifying affixes and base words, although the latter was an aspect they performed poorly in as well. The authors attributed the difficulty of producing derived words to the focus placed on the semantic and syntactic elements of the suffixes. This supported earlier findings that have highlighted how meaning can be lost in a passage when the analysis of the word structural properties take precedence (Craik and Lockhart, 1972; Perfetti and Hogaboam, 1975).

2.3 Dyslexia and Bilingualism

Research has shown that when acquiring a second language, it is likely that those with reading or learning difficulties will face problems. According to Ganschow, Sparks and Javorsky (1998), the ability to learn a foreign language is dependent on an individual's linguistic ability, and that the skills one possesses in their first language is crucial in learning a second language. This was echoed by Marogna (2013), who concluded that one's ability to acquire a second language is affected by how competent they are in their native language, as linguistic factors are major causal determinants for proficiency in an additional language (Marogna, 2013).

Previous studies have compared the reading abilities between bilinguals of varying orthographies, and have revealed cross-linguistic transfers of phonological skills, where phonological knowledge in reading proficiency in L1 would influence the L2: Spanish-English bilinguals (Durgunoğlu, Nagy and Hancin-Bhatt, 1993), Italian-English bilinguals (D'Angiulli et. al., 2001), Portuguese-English (Da Fontoura and Siegel, 1995), Dutch-English bilinguals (van Setten et al., 2017). Cross-linguistic transfers of morphological skills had also been observed in English-French bilinguals (Deacon, Wade-Woolley and Kirby, 2007).

A study comparing Spanish-English bilinguals to Chinese-English bilinguals (Bialystok, Majumder and Martin, 2003) revealed that the latter scored lower due to Chinese and

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English having contrasting phonetic and orthographic structure. The Spanish-English bilinguals, however, appeared to be at an advantage due to the shallow orthography of Spanish granting easy access to phonological awareness, and the fact that the alphabetic orthographic system, as well as their phonological structure of both Spanish and English are relatively similar. This was consistent with Fontoura and Siegel's study (1995) on Portuguese-Canadian children with dyslexia, where their findings revealed when compared to the English monolinguals with dyslexia, the bilingual children scored significantly higher, implying that there was a transfer of consistent grapheme-phoneme conversion knowledge learnt through Portuguese that were employed to facilitate reading in the more opaque English language. However, it was observed that in both languages, phonological processing deficits were found to be the underlying cause of their reading difficulties. In the study on Dutch-English bilinguals with dyslexia (van Setten et al., 2017), reading difficulties were observed in both languages, however reading and spelling deficits were more evident in English (L2), which implies that phonological deficits, or reading impairment would be found in L1 and L2 .

These findings support Sparks and Ganchow's (1993) Linguistic Coding Deficit Hypothesis (LCDH) which posits that difficulties in one's first language will impede the ability to acquire the acquisition of a second language. The hypothesis also attributes the underlying cause to phonological deficits. However, it is important to note that the degree of difficulties faced will vary across languages, due to the varying orthographies and unique characteristics that each language possesses (Dulude, 2012). If both L1 and L2 are similar in orthography and phonological structure, the learning could be made easier, as skills that had been developed in acquiring the first language may facilitate learning of the second language.

At the same time, the varying orthographic depth of the two languages have to be considered as well. In the case of Fontoura and Siegel's study (1995), Portuguese (L1) is considered of relatively transparent orthography compared to English (L2), similarly in van Setten and colleagues' study (2017) comparing Dutch (L1) and English (L2). Interesting to note is how the weak readers amongst the Portuguese-English bilinguals only displayed significant difficulties in in the English word reading task than the Portuguese reading task, but generally showed equal difficulties across the two languages, including the pseudo-word reading task, despite the varying orthographic depth. This was observed in the Dutch-English bilinguals as well (van Setten et al., 2017) and is consistent with findings from a study on Swedish (L1) and English (L2) bilinguals by Miller-Guron and Lundberg (2000). On the contrary, a study done by Andreo and Segklia (2017) on cross-linguistic skills transfer in learners with dyslexia in Greek (L1) and English (L2), revealed that weak decoding skills was more significant in English than Greek.

The importance of decoding skills in second language (L2) reading gives rise to a logical expectation that deficits in this area will affect L2 reading comprehension (Melby-Lervåg and Lervåg, 2011). This was seen in Mikulek's study (2015) comparing reading in English

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(L1) and Spanish (L2) through miscue analysis. The findings revealed that they were largely reliant on word-level decoding when reading in Spanish (L2). This was observed through significantly higher incidences of sounding out the words and reading the words repeatedly before proceeding to the next word, suggesting that their focus was placed on accurate decoding than reading for meaning. This was further supported through the miscues that did not semantically make sense (Mikulec, 2015). As such, their sentence level meaning was affected, in that they used prediction strategies to derive meaning, and relied on their background knowledge to compensate for their lack of understanding. In adopting this, they were only able to grasp a holistic view of the text, however the depth, details and nuances of the story were lost (Mikulec, 2015). The case study provides a different perspective on L1 and L2 reading, as the participants were typically developing adult readers proficient in both languages. Although Spanish was learnt as a foreign language, they were proficient enough to be teachers in the subject, and had been learning the language for 7 years. This gives us insight on the difficulties learners bilingual learners with dyslexia may face in the aspect of reading comprehension, and the negative effects of low proficiency in a second language on comprehending texts.

In learning another language, how one regards the usefulness and practicality of the language has to be taken into account (Crombie, 2000), as the acquisition of another language is influenced by one's motivation, self-esteem as well as anxiety levels (Marogna, 2013; Crombie, 2000; Ganschow et. al., 1998; Krashen, 1982). Past research has confirmed the low-levels of self-esteem in learners with dyslexia (Humphrey, 2002; Glazzard, 2010; Novita, 2016) as well as high level of anxiety (Novita, 2016) that can influence acquisition of a second language (Sparks and Ganschow, 1991). Furthermore, aspects of classroom accommodations, teaching approaches, and their overall learning experience in schools have shown to affect their levels of esteem (Humphrey, 2002; Glazzard, 2010). These factors, in turn, play a major role in determining a learner's motivation to learn (Harter, 1996).

Kormos and Csizér (2010) also raised the issue of self-concept affecting the motivation levels in learners with dyslexia, in that they held negative views of themselves as language learners, due to the nature of their difficulties. The authors also noted the concern of anxiety in acquiring German, of which they speculated traditional approaches exclusive to the language that were difficult for learners with dyslexia (Kormos and Csizér, 2010). In the case of Hungary learners with dyslexia acquiring either German or English as their second language (L2), the students generally did not display high levels of interest towards the L2 language (Kormos and Csizér, 2010). The authors concluded that the L2 languages were not widely used outside of school, and was thus perceived as yet another school subject. However, worth noting is that the learners studying English (L2) displayed more favourable attitudes towards learning the language, compared to those taking German (L2) (Kormos and Csizér, 2010). This is on account of English being used globally, which has led to higher levels of motivation to gain proficiency in the

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language. What is interesting is that the practicality of the English language took precedence over the simpler and transparent orthography of German (Kormos and Csizér, 2010).

2.4 Dyslexia and Malay Language

The Malay language is an Austronesian language, of which is the national language for Singapore, Malaysia, Indonesia, and Brunei (Tadmor, 2009; Benjamin et. al., 2009; Yap et. al, 2010;), although the standard Malay of each country differs slightly from one another, with Singapore's being almost exactly identical to Malaysia's Bahasa Malaysia. While Malay makes up one of Singapore's four national languages, the other 3 countries have Malay as their official language.

The Malay orthography is of sharp contrast to English. Its orthographic depth is characterised as being shallow, syllable structures simple, and morphology transparent (Yap et al., 2010). The Malay writing system uses Latin alphabets (Lee, 2008; Yap et al., 2010; Lee, Low and Mohamed, 2013). The writing system uses the five simple vowels, and the remaining consonants, with the exception of "x", are used. It possesses five digraphs, "gh", "kh", "ny", "ng" and "sy", and three diphthongs, "au", "ai", "oi" (Yap et al., 2010; Lee, 2008; Awang, 2004). The Malay language has been characterised as having shallow orthographic depth due to its letter-phoneme mapping being highly consistent; each letter corresponds to a single sound (phoneme) (Yap et al., 2010; Lee, Low and Mohamed, 2013; Zhang, Chin and Li, 2017).

To demonstrate with the Malay word *makan* (eat): the five letters (i.e. 'm' + 'a '+ 'k' + 'a' + 'n') correspond with five phonemes (i.e. /m/ + /a/ + /k/ + /a/ + /n/). Unlike in English words like "rain", for example, where the four letters correspond with only three phonemes (i.e. /r/ + /eɪ/ + /n/). The vowel "e" is the only exception in the direct letter-phoneme correspondence, in which it takes on two forms, /e/ and /ə/ (Yap et al., 2010; Zhang, Chin and Li, 2017). Although the regular letter-phoneme mapping suggests that phoneme instruction would be the basis of teaching reading skills, this is not the case. Rather, Malay reading instruction involves working at the syllable level instead of phoneme level, which includes segmentation and blending of syllables (Ziegler and Goswami, 2005; Winskel and Widjaja, 2007; Lee, 2008).

To date, there have been very few studies done on the impact of dyslexia in the Malay language. One case was done on native Malay low-progress readers by Lee and Wheldall (2011). The authors emphasised phonological awareness as playing an important role in Malay word reading, particularly the ability to manipulate phonemes and adopt a grapheme-phoneme decoding strategy, instead of a whole-word recognition strategy considering the consistent orthography of the language (Lee and Wheldall, 2011). The word reading error analysis revealed a significant number of non-word errors over visual errors, suggesting that phonological processing impairments

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affect the way in which words are decoded in Malay. This was also evident in Winskel and Widjaja's study (2007) amongst native early readers in Indonesia who speak *Bahasa Indonesia*, a slightly different form of the Standard Malay language used in Singapore and Malaysia. Interestingly, Zhang, Chin, and Li's (2017) study on English-Malay Singapore bilinguals found that the participants of his study, exhibited use of phonemic awareness in word reading too. Worth noting is that the participants were in Grade 3 and Grade 4, older than the readers in Lee and Wheldall's study (2011). Furthermore, they were typically developing readers. It is interesting that despite Malay reading instruction in Singapore focusing on syllable level, phonemic awareness was found to be a significant contributor to word reading (Zhang, Chin and Li, 2017).

Lee and Wheldall (2011) observed the role of syllabic structures in Malay reading, and found that the presence of digraphs and the position it appeared determined the complexity of the syllable, especially since the majority of Malay words are multisyllabic, even at beginner levels of reading (Zhang, Chin and Li, 2017; Lee et al., 2012). Furthermore, despite Malay having only few consonant clusters (Winskel and Widjaja, 2007; Yap et al., 2010), the language has digraphs that are frequently occurring. The presence of diphthongs and the letter e (since it has two phonemic forms) also contributes to the increasing difficulty of words (Lee and Wheldall, 2011; Zhang, Chin and Li, 2017). The complexity in the syllables or words of the language is expressed by both syllable and phonic structure (Lee and Wheldall, 2011).

Malay words have simple syllable structures, and a review by Lee (2008) identified the four basic ones being V, VC, CV, and CVC. Multi-syllabic words dominate the Malay language, in comparison to mono-syllabic words, with most Malay words constituting various combinations of the basic syllables. For example, CV and CVC can combine to form a simple two-syllable word like *rumah* (house), but *masyarakat* (society) made of CV + **C**V + CV + CVC has four syllables combined including a digraph (represented as **C**), thus increasing the complexity of the word (Lee, Low and Mohamed, 2013). The weak readers in Lee and Wheldall's study (2011) were observed to struggle with recognising and segmenting the different syllable structures. Specifically, as syllabic complexity increased, word reading performance decreased (Lee and Wheldall, 2011; Winskel and Lee, 2013). Thus the authors concluded that syllables, on top of phonemes, play a significant role in word reading. The participants here were Grade 1 students, and so this finding is expected, since they are still developing reading acquisition.

Zhang, Chin and Li's study (2017) on typically developing readers revealed that morphological processes, on top of phonological processing, underpinned reading acquisition in English-Malay bilinguals. The participants were found to use morphological knowledge as a supplementary skill to phonological decoding, where morphemes and derived affixes were involved (Zhang, Chin and Li, 2017), as well as spelling multisyllabic affixed words (Winskel and Widjaja, 2007). Past research (see Section 2.2) has shown how morphological awareness may serve as a compensatory strategy when reading

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(Casalis, Colé and Sopo, 2004). However, the complexity of the morphological structure that will vary across languages could affect decoding competency in a particular language in learners with dyslexia. In the case of Malay, words are largely formed through affixation, of which there are 25 derivational affixes in Malay (Lee and Wheldall, 2011; Zhang, Chin and Li, 2017; Prentice, 1987). These include prefixes (e.g. ***me-*** *+ makan* [eat] ⇨ ***me****makan* [eating]), suffixes (e.g. *ajar* [to teach] + ***-an*** ⇨ *ajar****an*** [teachings]), and circumfixes (e.g. ***ke-*** *+ kuat* [strong] + ***-an*** ⇨ ***ke****kuat****an*** [strength]). Generally, derived forms of words do not lead to any phonological or orthographic shifts. However there are exceptions for prefixes *pe-* and *me-* (Yap et al., 2010; Zhang, Chin and Li, 2017) where the prefix will change depending on the first letter of the base word. For example, when prefix *me-* is added to the base word *sebut* (to say), the prefix *me-* changes to *me****ny-,*** while the "s" in the base word is dropped to form the new word *menyebut* (saying). Other examples include *pe-* changing to *pe****ng-*** when added to the word *karang* (to compose), forming the new word *pe****ng****arang* (author), where the initial letter of the base word, "k", was dropped. Reduplication is another means of word formation (Lee and Wheldall, 2011; Zhang, Chin and Li, 2017). With the word *murid* (student), it becomes a plural form upon reduplication, *murid-murid* (students).

Compounding is another way in which words are formed in the Malay language. For example, compounding the two words *kolam* (pond) and *renang* (swim) results in the formation of a new word, *kolam renang* (swimming pool). Complex forms as a result of reduplication and affixation can also emerge, like in the word *hormat* (respect) becoming *hormat-menghormati* (respect each other), where *menghormati* involves prefix *me-* changing to *meng-.* Lyytinen and Lyytinen (2004) conducted a study on Finnish, a transparent and agglutinative language, and hypothesised that participants who had displayed difficulties with morphological awareness during their earlier years of reading acquisition was at risk of being diagnosed with dyslexia in the future. In the Malay language, the complexity of derivation and the frequency of its occurrence may impede reading acquisition among learners (Zhang, Chin and Li, 2017) . This was seen in Lee and Wheldall's (2011) study in Malay native-speakers. Longer multisyllabic words that had derivational affixes attached to them compounded the difficulties of the low-progress readers in their study (Lee and Wheldall, 2011). Worth noting is that the authors attributed this difficulty to the increasing word length that extended beyond three syllables as a result of affixation, and not the complexity of the affixes specifically.

To date, very few studies have discussed reading comprehension in the Malay language, more so in learners with difficulties or bilinguals. Thus, comparisons can be drawn from studies in other similar languages. Bertram, Laine and Virkkala (2000) studied the effects of morphological knowledge in vocabulary acquisition in the Finnish language. The findings showed that its morphologically-rich nature required learners to utilize morphology when comprehending texts, particularly those that comprise of words infrequently used or seen. Since Finnish is similar in nature to Malay orthography, their findings raise the possibility of learners with dyslexia learning Malay being at an

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advantage when trying to get through reading comprehension tasks that could otherwise be overwhelming. However, relying on morphology alone is not sufficient; other skills required to support learners in reading comprehension tasks include contextual cues, syntactic skills and semantic skills (Adams, 1977; Boets et al., 2010; van Bergen et al., 2012).

Carlisle's commentary (2003) stated how syntactic errors are seen amongst weak readers, which suggests that learners with dyslexia reading Malay passages, despite being able to use morphological knowledge to facilitate their reading, may have difficulties accessing syntactic information in affixed words, and thus may not be able to derive meanings from words this way. In the context of Malay, although the earlier examples on affixation show close relations between the base word and the affixed forms, deriving meaning from the newly formed words may not be so clear-cut. For example the base word *satu* (one) can become *ber + satu* (be united) and *per + satu + an* (an association). Key words in a text that comprise of derived affixation in a similar manner may thus give rise to syntactic errors in turn affecting one's reading comprehension. In the context of learners with dyslexia in Singapore, although they would have developed morphological awareness at a young age in learning Malay, the elements of syntax, semantics, and vocabulary also come into play, on top of their phonological deficits. Furthermore, the bilingual aspect has to be considered too. The research aims to add further insight into the difficulties in reading comprehension amongst learners with this unique profile.

Drawing parallels from past research on dyslexia and bilingualism with English-Malay bi-literacy in Singapore in the aspect of motivation to learn the language, if a learner with dyslexia does not predominantly use Malay for communicating or views it as having little practical use, there may be little motivation to be proficient in the language, even if Malay's shallow orthography makes it an easy language to acquire. Cavallaro and Serwe's study (2010) revealed that younger age groups tend to demonstrate higher use of the language than the older participants. The authors attributed this to the social networks comprising mainly of their family members and ethnic peers. Interestingly, across all age groups, other than when speaking with relatives, the use of the Malay language was found to be mainly used when communicating with religious teachers and Malay shopkeepers. The findings also revealed the language shift from Malay to English takes place as one gets older (Cavallaro and Serwe, 2010).

The language predominantly used at home is largely influenced by parents' perspectives as well. A study by Abu Bakar (2015) revealed a large percentage of Malay parents in Singapore who used English or predominantly used English than Malay in their homes. The inclination to use English at home, despite most of them conversing with their spouses in Malay, was attributed to supporting their child's proficiency of English in school due to it being the language of the curriculum. However, the findings also revealed that these parents did not want the Malay language to be lost on their

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children, and hence would prefer to send their children to Malay-speaking religious classes as a means of maintaining the language, despite knowing that their child learnt better in English (Abu Bakar, 2015).

However, published studies exploring this aspect of learners with this unique profile is close to none. The concern with motivation is one that warrants investigation, particularly due to the bilingual landscape of Singapore, and the learning challenges of dyslexia. Norhaida (2009), in her study on the linguistic practices of bilingual Singapore Malay students, cited Holmes (2008) on how institutional support is crucial to ensure an ethnic language is preserved, amongst which education was considered an important domain of support.

Although use and appreciation of the language can develop from reading more Malay books and coming up with more engaging reading materials, more importantly is the creation and planning of lessons, instruction, and teaching resources that will need to take into account the varying needs of learners and their different levels of proficiency and ability (Norhaida, 2009; MOE, 2005). Specifically, with the increased exposure to English due to the education system in schools, the perceived relevance of learning Malay comes into question. These factors determine how much exposure a learner with dyslexia will have to the Malay language, and will influence how they perceive the relevance of learning the language and the practical aspects of using it. This may be especially important for English-Malay bilingual learners with dyslexia, as their language deficits may already affect their performance in the English language (L1) in comparison to their peers.

2.5 Research Gap

The literature review suggests that acquiring the Malay language may not be as easy the shallow orthography sets it out to be, and that there are several factors that could impede learners with dyslexia from achieving proficiency in the language. Winskel and Widjaja (2007) conducted their study on Indonesian Malay (*Bahasa Indonesia*), while the study by Lee and Wheldall (2011) was on Malaysian Malay (*Bahasa Melayu*). They are different in that *Bahasa Indonesia* has its letter names directly corresponding to the sounds the letter makes, whereas *Bahasa Melayu*, which is the standard form of Malay, does not have letter names that correspond to the letter sounds (Winskel and Lee, 2013). The Malay language used and taught in Singapore uses the standard form of Malay, like Malaysia.

Although insights can be gained from both studies mentioned, as discussed in the review of the literature, their findings have to be exercised with caution when making generalisations in local context. This is largely due to Indonesia and Malaysia having Malay as their national language, a stark contrast to Singapore, where English is the main language, and a student of Malay ethnicity only receives official Malay language

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instruction as a subject in school. While past studies have provided us some insight on the difficulties that have affected word reading in Malay, further research needs to be done to give us a better understanding of the challenges unique to bilingual learners with dyslexia. Additionally, these studies have been either in typically developing readers, or weak, beginner readers, but little has been said for those who have already passed the early stages of reading acquisition.

Furthermore, the focus of past research in Malay has been in relation to word recognition, rather than reading comprehension. However, with reading comprehension being the function of word reading, the limited published studies investigating this important aspect warrants the need to understand how dyslexia affects Malay comprehension too, particularly in bilingual learners.

Finally, in view of the previous studies in the literature review that found self-esteem to affect second language acquisition amongst learners with dyslexia, considerations need to be made in promoting learning of the Malay language in classroom amongst learners with dyslexia; ensure they are supported to maintain healthy levels of esteem (Glazzard, 2010), employ effective teaching approaches that considers their learning difficulties (Kormos and Csizér, 2010) and provide them with opportunities for success (Crombie, 2000; Kormos and Csizér, 2010). As such, when analysing how bilingual learners with dyslexia learn the Malay language in Singapore, it is important to consider their perception and attitudes they have towards the language, along with their learning experiences in the classroom.

Moreover, while Singapore's bilingual policy places emphasis on Mother Tongue competence, the progressive language shift to English as a result of English being the *lingua franca* and language of the curriculum, shows how the Malay language has been eclipsed by the prevalence of English. Thus, the element of being bilingual may compound the learning challenges in dyslexics acquiring Malay, more so in current Singapore where the use of Malay continues along a downward trend.

2.6 The Present Study

Given that the past studies on dyslexia and Malay have found phonological awareness to be a predictor of reading in the language, the present study adopted the phonological deficit theory of dyslexia. The present study was conducted on Singaporean English-Malay bilinguals with dyslexia that investigated their word reading abilities (influenced by morphological and syllabic complexity in words) vocabulary, comprehension skills, and attitudes towards learning Malay.

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There were three main questions that guided this study:

1. What are the reading difficulties faced amongst bilingual learners with dyslexia?
2. What are the challenges faced when comprehending texts?
3. What are the perceptions and motivations towards learning Malay?

3. METHODOLOGY

3.1 Research Design and Rationale

Due to the unique profile of the learners – English-Malay bilinguals in Singapore with dyslexia – having yet to be studied, a qualitative research method was used. Moreover, although prior studies had revealed the possible factors affecting reading and comprehension, the complexity of the problem given the profile of the learners had yet to be captured, therefore necessitating further exploration of the factors contributing to their difficulties. Using a qualitative method was also important in understanding the thoughts and behaviours of the participants when discussing their difficulties, particularly their perceptions on learning Malay.

Since the present study intended to investigate learning challenges in Malay, as well as gain insights on the learners' behaviour and attitudes, a multi-case study research appeared to be the most appropriate way of capturing the data required to answer the research questions.

3.2 Participants

The participants were eight students whose school levels ranged from Primary 5 to Secondary 1, aged 11 to 13. All of them had a diagnosis of dyslexia and were studying at local, mainstream schools. At the time of the study, they were current students of the Dyslexia Association of Singapore (DAS), receiving intervention for the English language. They were all of Malay ethnicity, and were taking Malay as their Mother Tongue language.

3.3 Sampling and Recruitment

The study was approved by the Ethics Committee of the University of South Wales and the DAS Research Committee. Upon approval, a nation-wide recruitment process across the 14 DAS Learning Centres took place. Ethical considerations were described and explicitly stated in both parents and student information sheets.

In order to ensure participants met the inclusion criteria, a parent survey form was disseminated to interested parents.

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The inclusion criteria for potential participants comprised of the following:

a. currently in Primary 5 to Secondary 1 levels
b. from a predominantly Malay speaking at home
c. not exempted from Mother Tongue (MT)
d. not receiving external support (e.g. private tuition)
e. no known comorbidities
f. failing MT or scoring borderline pass for the past two years

The rationale behind the first criteria was a means of ensuring the participants would be able to express themselves well, and provide reliable data to the researcher. Studying at the stated levels was also a means of ensuring the participant had received adequate years of exposure to the Malay language, and would have already been taught the foundations of the language. For the learners to be pre-dominantly Malay speaking indicated that they were familiar with the Malay language. It was important that the learners were not exempted from Malay, so that they would be able to share recent accounts and experiences. The fourth criteria ensured that their difficulties were not a result of confusion between different teaching approaches or support from places other than their schools. It was also important that the students did not have comorbidities, as any findings observed may be a result of other underlying learning difficulties rather than dyslexia. The final inclusion criteria ensured that these learners showed persistent difficulties in the Malay language. Exclusion criteria included criteria that fell outside the boundaries of the inclusion criteria.

Recruitment was assisted by a member of the Research Committee and other Educational Therapists in the organisation to recommend students who would potentially meet the criteria. Two of the participants only met five of the six criteria, in which the participant was scoring well in Malay. However, these participants were still considered a potential participant, as their participation would allow the researcher to explore for any differences or commonalties during the cross-case analysis, thus contributing to the richness of the data gathered. Through these recruitment techniques used, a total of 8 participants consented to their taking part in the research.

3.4 Development of Assessment Tools

For this qualitative study, multiple sources of data were gathered, namely through semi-structured interviews, three reading-related tests (pseudo-word reading, single word reading, vocabulary and sentence comprehension) and a review of documents (exam papers). The multiple forms of data collection ensured the participants' accounts were substantiated, and ultimately represented correctly.

Three sets of tests were developed that were designed in line with the research questions: pseudo-word syllable reading, single word reading, sentence comprehension.

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Since there is currently no Malay standardised tests, the tests had to be developed and checked for validity and reliability. Details of how each tool was designed and developed are elaborated below. Several factors were taken into consideration in designing these research instruments, due to the unique profile of the participants. As such, considerations included the structure of the interview, questioning techniques used, clarity of instructions given, duration of each test, fonts and spacing in the test (McGrath, Palmgren and Liljedahl, 2019). In addition to that, it was important that the administration of each task was not prolonged, as it may lead to a loss of attention.

3.4.1 Interview Questions

The primary source of gathering data was through semi-structured interviews to provide a deeper understanding of the participants' experiences and views. The interview questions developed were aligned with the research questions, covering the aspects of reading difficulties faced, understanding Malay words and passages, perceptions of learning Malay, and understanding their attitudes towards learning the language. The questions consisted of an interplay of direct questions, probing questions, specifying questions, and indirect questions (Brinkmann and Kvale, 2018) . Their age group and their learning difficulties might make it difficult for them to elaborate or extensively convey their accounts. Thus, the flexibility in the questioning techniques was to ensure that the important themes were being covered, while allowing the researcher to probe further in the event that the participants raised potential themes beyond their initial responses. The leading questions were imperative in verifying the interpretations of the participants' responses, particularly to test the reliability of their answers where information was lacking or unclear.

3.4.2 Syllable Word Reading

A list of non-words was developed to measure decoding skills, based on the theory that a phonological deficit is the underlying cause of dyslexia (Snowling, 2013). However, since Malay reading instruction in Singapore schools involves working at syllable level, conducting a task on mono-syllabic non-words seemed appropriate. The test was developed based on the quality criteria outlined by Colenbrander, Nickels and Kohnen (2011). Firstly, the list included words of varied difficulty levels that served as a sensitive measure that would be able to detect any difficulties. It had 37 words, a practical consideration to ensure the test could be administered in a short amount of time, since the purpose was to understand problems with grapheme-phoneme mapping (Colenbrander, Nickels and Kohnen, 2011). Furthermore, a stopping rule was not considered appropriate since it was imperative to capture as much information about the participants' decoding abilities. The non-words selected were also consistent, in that the words would never be pronounced differently, regardless the position of the letters. Syllables with the letter "e" were the only exception, where participants would be tested to retrieve both sounds of "e". The test also comprised of words where the grapheme-

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phoneme correspondences differed in complexity, in which digraphs and diphthongs were included. The digraphs and diphthongs comprised of letter combinations that occurred in the Malay language, as Colenbrander, Nickels and Kohnen (2011) highlighted that non-words should be orthographically legal. The list was arranged in order of increasing word difficulty, with digraph and diphthongs syllables only appearing towards the end of the list (Colenbrander, Nickels and Kohnen, 2011).

3.4.3 Single-word Reading

The reading list aimed to assess reading ability in words of varying structures. Reference was made to Lee and Wheldall's study (2011) in choosing appropriate words to include. There were 7 levels in the test, corresponding to the school levels from Primary 1 to Secondary 1. Each level had 12 words, of which the words were derived from the respective Malay textbooks.

The words were carefully selected based on (a) the frequency of occurrence in a given level, and (b) phonological structure (syllable and phonic structure), as recommended by Lee and Wheldall (2011). They were sequenced in order of difficulty level. The level of difficulty of each word was determined by the complexity in syllabic and phonic structures, and was sequenced according to Lee and Wheldall's (2011) recommendation. The participants had to read a total of 84 words.

3.4.4 Vocabulary and Sentence Comprehension

A list of sentences was developed to test for comprehension and vocabulary. Based on past evidence that found morphological awareness to affect comprehension (Carlisle, 2003; Zhang, 2016), the test was designed as an affix choice task similar to Zhang, Chin & Li's study (2017). Furthermore, affixation is one of the main ways in which Malay words are formed (Lee and Wheldall, 2011; Zhang, Chin and Li, 2017). Comprehension was measured through sentences rather than passages, to avoid possible feelings of frustration or intimidation in the participants.

The test was divided into 7 parts, where each part comprised of 4 questions that aligned with the content covered at the respective school levels between Primary 1 to Secondary 1. They were arranged in order of increasing difficulty. The affix choices only included those that had been learnt at each level, based on the syllabus by the Ministry of Education (MOE). The affix choices given to fill in the blanks were real derived words, as this task also served to test for the vocabulary of the participants. Comprehension questions were based on Bloom's taxonomy. Since sentences were used here, question types primarily involved literal skills, focusing on recalling and understanding the text.

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3.4.5. Validity of Reading-related Tests

To ensure the validity of the developed tests, content validation was measured using subject matter experts. Two Malay Language (ML) teachers were consulted for this process, of whom were teaching in different schools. Their role was to evaluate the testing tool and agree on whether the items tested were relevant as an appropriate measure for this study (Wynd, Schmidt and Schaefer, 2003).

The single-word reading test was evaluated using a rating scale, while the other two tests were evaluated for relevance qualitatively. Inter-rater agreement was measured using Scale-level Context Validity Index. 80 of the 84 items achieved a high relevance rating amongst the two raters. The S-CVI/UA was 0.95.

3.5 Data Collection Process

3.5.1 Interview

The sessions with the participants were conducted at their preferred DAS learning centre, to allow them to feel comfortable during the process, as McGrath, Palmgren and Liljedahl (2019) stated how interviews may be perceived by some as difficult. Ethical considerations were made throughout the interview process (Creswell, 2013), more so since the participants were a vulnerable population. Despite the participants having already signed the consent form earlier during the recruitment process, details of the study were being shared verbally at the start of the session (Creswell, 2013). Participants were also informed that their identities remained anonymous. The purpose of the interview was explicitly shared, and how their experiences will contribute to the study (Brinkmann and Kvale, 2018).

Following the interviews, three tasks were administered in the following sequence: pseudo-word syllable reading, single-word reading, and sentence comprehension. At the end of each test, participants were asked to share their opinions regarding the test, any items they found particularly difficult and the reason for their difficulties. The duration of the interview session and test administration combined was between 60 to 75 minutes for each participant. Each session was audio recorded with their, and their parents' consent. One of the participants opted to have the session conducted online via video conference, due to the pandemic – the call was recorded, without any video.

3.5.2. Pseudo-word Syllable Reading

Participants were shown a list of syllables and were tasked to read them aloud from left to right. They were informed that they were non-words, but could be read as though they were real words. The syllables were printed on an A4-sized paper.

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3.5.3 Single-word Reading

Participants were asked to read a list of 84 real words. They were informed that they were to read the words at their own pace, and since the words got increasingly difficult they had the option to stop at any point in time. Participants were also aware that they could skip words they found too challenging. To ensure clarity of the printed words, the test was presented on an A3-sized paper.

3.5.4 Vocabulary and Sentence Comprehension

Participants were asked to read aloud 28 sentences, while filling in the blanks with a suitable affixed word from three given options. All affixed words were real words. In testing for comprehension, literal questions were asked regarding the sentence they had just read. Where errors were displayed in a question, whether in the aspect of word recognition or selection of affix, participants would then be asked to define selected words in the given sentence. In instances where confusion was exhibited in choosing an appropriate affix, participants were asked to explain their choices. This test required them to answer verbally. Test questions were presented on an A4-sized paper.

3.5.5 Exam Papers

Participants were required to submit a latest copy of their school examination or tests. This provided an alternative angle to understanding their difficulties. Bowen (2009) stated that reviewing documents had various functions, some of which included providing supplementary data and verifying findings. The exam paper components on reading comprehension and affixed vocabulary were analysed to corroborate their experiences shared during the interview. During the interview session, the exam papers were also used as a reference point for the participants. Specifically, when relaying their experience in learning Malay, exam papers allowed the participants to make references to the specific components learnt, which then lead to participants sharing more detailed and rich accounts. However, not all participants provided exam papers, and thus its purpose in this study was primarily for verification of findings from the other sources of data stated above.

3.6 Data Analysis

Once the data collection process had been completed, data analysis and interpretation followed to identify the difficulties in reading and comprehension, as well as the perceptions and motivations towards learning the Malay language.

Thematic analysis was conducted to identify and analyse patterns within the data. Specifically, a general inductive approach was used to allow themes to emerge from the raw data (Thomas, 2006; Creswell, 2013). A qualitative analysis software, Quirkos, was

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used throughout the coding process. Through the inductive analysis coding process, four major themes and five sub-themes were identified that established the framework for the findings directly relevant to the research questions.

4. RESULTS AND FINDINGS

Participants' Profiles

There were 8 participants for this study, in which the inclusion criteria was ensured through the Parents' Survey from submitted upon expression of interest to participate. Although Participant 1 showed high performance in Malay, he was still included in the study as his Malay reading ability was indicated as *somewhat difficult*. Details of the participants are tabulated below in Table 1.

Table 1. Participants Profiles

Participant	School Level	Duration of study in DAS Main-Literacy Programme	Performance in Malay Language (% range)
1	Primary 6	9 months	65% - 69%
2	Primary 5	6 years	50% - 59%
3	Primary 5	5 years	<30%
4	Primary 6	8 months	30% - 39%
5	Primary 6	8 months	50% - 64%
6	Primary 5	1 month	50% - 59%
7	Primary 6	10 months	40% - 49%
8	Secondary 1	7 months	50% - 59%

Presentation of Themes

A qualitative multi-case study approach was used for the study, with findings gathered primarily from semi-structured interviews. Observations were also made on three activities conducted with the participants: a monosyllabic word reading task, single-word reading task, and a sentence comprehension activity. Inductive thematic analysis was employed for this research. 4 major themes emerged that answered the research questions: (a) word reading difficulties, (b) reading comprehension difficulties, (c) perceived usefulness, and (d) supportive learning environment.

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4.2. Word Reading Difficulties

The first of the interview questions was in relation to the difficulties faced, if any, when reading Malay words. Due to the young age group, and the unique profile of the students, the initial question that was being asked was a close-ended question. The intended purpose of this was to act as a starting point, which was to allow the researcher to probe further with open-ended questions depending on their initial response. For example, if the researcher had started with "What are some of the difficulties you face when reading?" would be to assume that every participant faced difficulties in their reading, which may not be the case, as they may be struggling in other aspects of the Malay language instead.

The open-ended question may also be too broad for this age group, and hence may easily result in "I don't know". In response to this question, four of the participants confidently expressed that they were able to read Malay words, 2 of them said they were only able to do so sometimes, while 1 of them said he was unable to read Malay words entirely. Difficulties in word reading shared from the interviews and observed through the reading-related tests emerged as the following categories:

(a) difficulties reading unfamiliar words,
(b) difficulties reading long words,
(c) difficulties reading words with complex syllabic structures and affixes.

4.2.1 Difficulties Reading Unfamiliar Words

Seven of the participants shared that reading difficulties they faced was a result of mispronouncing the words, particularly for words that were unfamiliar, as remarked by Participant 4:

> *"...if I've never seen it before then that's the part when I... when I always uh do something wrong."*

Drawing comparisons to Participant 5 who demonstrates a better understanding of the language compared to the others based on the school performance scores provided, her sentiment was no different, as explained:

> *"...some words that is like n-not common to me, I will have... mm... hard to pronounce it."*

Due to the term "familiar" being subject to one's experiences and background, the findings from the single-word reading activity were analysed to observe whether any patterns emerged to corroborate their claims.

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Table 2. Number of errors made at each reading level.

SCHOOL LEVEL	PARTICI-PANT	Pri 1 words #1 - #12	Pri 2 words #13 - #24	Pri 3 words #25 - #36	Pri 4 words #37 - #48	Pri 5 words #49 - #60	Pri 6 words #61 - #72	Sec 1 words #73 - #84
Pri 5	**2**	0	0	0	0	1	1	**2**
	3	0	2	1	2	4	3	**7**
	6	0	0	0	2	0	1	**5**
Pri 6	**1**	1	0	0	0	2	1	**3**
	4	0	0	0	0	2	0	**6**
	5	0	0	0	0	2	0	**4**
	7	0	1	2	1	3	2	**5**
Sec 1	**8**	0	0	1	0	0	0	**4**

Pri = Primary, Sec = Secondary

Table 2 details the number of reading errors made at each level by the participants. Each participant showed minimal errors when reading the words that were below their grade level. To demonstrate, Participant 2 who is in Primary 5, made no errors when reading words from the Primary 1 to Primary 4 levels. This would be due to having seen them over the years of learning the language. However, difficulties surfaced upon reading words in her grade level and beyond, with the highest number of errors made when reading common Secondary 1 words. Generally, all the participants found the words in Secondary 1 the most challenging, as these words would be considered the least familiar to them.

The findings from the activity support the claims made by the participants suggests that having exposure to a wide range of words plays an important role in achieving reading accuracy.

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4.2.2. Difficulties Reading Long Words

There were mixed responses with regard to whether the length of the word affected their ability to decode, and hence read. Upon reflecting on this, Participant 7 highlighted how the length of the word contributed to her reading difficulties:

> *"3 syllables can. But then when it's more than 3 syllables I cannot."*

On the contrary, Participant 4 expressed how the length of the word was secondary compared to familiarity with the word:

> *"...if I see it before, then it'll be easy."*

The other participants displayed some struggles with trying to elaborate on the details of their reading difficulties, with most of them explaining their difficulties as "difficult for me to pronounce it". Results from the single-word reading task of commonly seen words at each level provided more insight.

Table 3. Observations in reading affixed words from Single-Word Reading task

PARTICI-PANT	NO. OF ERRORS	ERRORS WITH AFFIXED WORDS	ERROR OBSERVATIONS
1	7	0	None
2	5	1	Affix -i
3	20	5	Syllable boundary confusion with digraph *ny* (*menyambut* ⇨ *men-yam-but*) Phonetic confusion—(*mengetahui* ⇨ *men-je-tahui*)
4	8	2	Affixed words with 4 syllables Phonetic confusion—(*mengetahui* ⇨ *meng-ge-tahui*)
5	6	2	Affix -i
6	8	0	None
7	14	6	Phonetic confusion—(*mengetahui* ⇨ *meng-ge-tahui*) Visual confusion—(*menghargai* ⇨ *menghargia*) Visual confusion—(*kegemaran* ⇨ *keng-gemaran*)
8	5	1	Phonetic confusion—(*mengetahui* ⇨ *meng-ge-tahui*)

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Based on the findings in Table 3, although affixes are considered long words, the errors made by the participants were not particularly skewed towards affixed words. In fact, errors with affixed words only made up a small proportion of the total number of errors made.

Since the reading list also comprised of non-affixed long words and words with varied syllable structures, the other errors were examined for any commonalities or patterns.

4.2.3. Difficulties Reading Words with Complex Syllabic Structures and Affixes

Analysis of the errors revealed that their challenges were attributed to the complex syllable structure of the word and retrieving the corresponding sounds.

While errors with affixed words were observed, Table 2 shows that this was not particularly difficult for the majority of the participants. In fact, the participants were observed to have slowed down their reading pace when reading the words with affixes, as the morphemes allowed easier segmentation of the word into syllables. It is interesting to note that Participant 3 was the only one who raised that being able to read words accurately was dependent on the time given to decode a word:

> *"...if I take some time to read it then it won't be difficult..."*

While his struggles with affixed words were evident during the activity, further observations on his error types in the syllable reading task revealed that his errors were attributed to words with ng and ny digraphs, rather than the affixes. Participant 7 struggled with the affixed words too, however this was particularly with words that had two vowels. She shared her confusion on VV syllable words that she had skipped during the task, as explained:

> *"because it's like confusing... the first one (syllable) is usually like 'ter' 'se' 'na' 'men'... ya like that I can but then this type right is like 'f-a-e...'"*

Through these findings it is thus understood why some participants would have difficulties decoding longer words. Another observation worth noting was challenges in reading words that had more complex syllable structures. A breakdown of the error types from the reading task are shown in Table 3.

Most of the participants had difficulties reading *teladan* (a model example of), due to the complex syllable structure, CVCVCVC. The majority read it as *"telandan"*, while Participant 1 read it as *"taladan"*, and Participant 3 and 6 as *"telanda"*. Although there were other words with the same syllable structure that were read correctly, perhaps the unfamiliarity of the word, as explained earlier, lead to the visual error.

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Table 4: Error types from Single-word Reading Task

ERROR TYPES	PARTICIPANTS							
	1	2	3	4	5	6	7	8
Inconsistent 'e'	✓	✓	✓	✓	✓	✓	✓	✓
vowel substitution	teladan ⇨ taladan							
letter substitution							✓	
vowel/letter substitution			✓		mudah ⇨ mudar	✓	✓	
digraph	kh tarikh ⇨ tarik	kh	ng, ny, sy,	kh	✓		kh	
addition		✓	✓	✓		✓	✓	
deletion	siapa ⇨ siap		pandai ⇨ pada	pantas ⇨ panas		✓		
combination				✓				
reversal	asal ⇨ asla							telah ⇨ letah
English 'g',	✓	✓	✓		✓	✓		
English 'u'							✓	
CV + CV + CVC,	✓	✓	✓	✓				
CV + CVC +CV				✓	✓			
VV			✓				skipped ✓	

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It appears that reading challenges were more apparent with unfamiliar or more complex words, as it required them to use their decoding skills. Phonetic errors, that is errors associated with phonological deficits were seen across all participants, whether it was errors of substitution, deletion, addition and reversal of letters and syllables, or a combination of them.

All participants also exhibited at least one error related to vowel "e", as it carries two sounds. To illustrate, the word *tema* (theme) was pronounced with the /e/ sound instead of /ə/, and this confusion became more evident in words that were more unfamiliar like *lagenda* (legend).

Five of the participants made errors that displayed confusion with the English language, notably with the letter "g". For the word *lagenda* (legend) for example, the five participants pronounced it with a /j/ sound. Participant 4 and 7, showed confusion with the English language in other aspects. During the syllable reading task, Participant 4 shared that "ing" and "ung" was confusing for him as he "thought it was English". As for Participant 7, she did not explicitly share that she had any confusion, however it was observed in both the syllable reading task and the single-word reading task that she would recognise words with the "u" as /ŭ/, like in "up" instead of /oo/. These observations are perhaps unsurprising, since the participants would have been used to decoding in English with it being the main medium of instruction in Singapore. This will be further discussed in the discussion section.

Taking into account these observations and findings made, it appears that affixed words may not necessarily be a challenge simply because of their length. Instead, the ability to accurately decode words in general was dependent on the base word: familiarity with the word, length, and complexity of the syllable structure.

4.3. Challenges in Reading Comprehension

When asked about the challenging aspects of learning the Malay language, most of the participants (n=7) expressed reading comprehension as one of their main difficulties. Factors that contributed to this varied between the participants, in which 2 themes emerged: (a) weak vocabulary, (b) difficulties with long passages.

4.3.1. Weak Vocabulary

A common theme that emerged was associated with the understanding of the text rather than decoding of the words. All the participants highlighted how the ability to understand a story was dependent on how familiar they were with the words that appeared in the passage. If the vocabulary in the text was not perceived as common, regardless their ability to decode the word attempting to understand the passage would present as a challenge, as Participant 8 explained:

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"...Sometimes like the article got the new words that I don't even understand and I don't know how to pronounce it. I sometimes just skip that word then I just continue reading... I don't understand the meaning ah, but then pronouncing I try ah."

This difficulty was echoed by Participant 4:

"I finish reading, but I don't know what I read."

These remarks raised two areas that affected their comprehension: firstly, the ability to recognise words correctly, as discussed in Section 4.2.1, and secondly, being able to recall the right meaning attached to the word.

This was further supported by the observations made during the Sentence Comprehension activity. Tabulated below is an overview of the types of errors observed during the task.

Table 5. Observations from Sentence Comprehension Task

Participants	ERRORS AFFECTING COMPREHENSION			
	Inferring without defining	**Weak morphological awareness**	**Wrong context**	**Wrong definition**
1	**5**	2	3	4
2	3	1	1	**6**
3	3	2	1	**11**
4	2	3	not observed	**6**
5	**4**	2	not observed	1
6	**5**	2	2	**6**
7	not observed	not observed	not observed	**4**
8	**8**	1	1	5
TOTAL ERRORS	**30**	**13**	**8**	**43**

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Seven of them had difficulties providing the definitions for words or phrases in the sentence. It is relevant to note that these words may have been read correctly but the participants were not able to define them At times this was a result of substituting the words for another real word. To demonstrate with one of the questions:

> *Salmah _____ (ajakan, mengajak, diajak) saya ke majlis hari jadinya.*
> *[Salmah invited me to her birthday party. ; Answer: mengajak]*

Participant 2 was able to provide the correct answer and fluently read the sentence. However when asked what Salmah was doing, she responded with "... teach me". It appears that she processed the word as *mengajar* (verb: teaching), where the base word *ajar* is the Malay word for "teach". While she was able to recognise the word correctly, she was unable to recall the right meaning attached to the word, instead providing the definition of the substituted word.

Participants 3, 4 and 6, on the other hand, misread *majlis* (event, or party in this context) as "*majilis", "majalis"* and "*majid"* respectively. When asked to define the word, all of them responded 'mosque'. The Malay word for "mosque" is *masjid*. In this case, the three participants were unable to identify the word correctly, and thus were not able to retrieve the correct meaning.

At times the incorrect definitions were instead inferred based on the semantics of the word. To give an instance with one of the questions:

> *Saya hendak _____ (pendapat, terdapat, mendapat) keputusan yang cemerlang.*
> *[I want to achieve / get excellent results. ; Answer: mendapat]*

Participant 6 and 8 were both able to provide the correct answer here. However, when asked to define *cemerlang* (excellent), Participant 6 said "like...he (is) smart", while Participant 8 defined it as "proud". *Cemerlang* is often associated with school, success, and good grades which explains their answer. As a result, this alters the meaning of the sentence and thus their comprehension.

When asked about the details of the sentences, the participants were also observed to understand the main idea without diving into the details, leaving out words they found challenging. Take the response of Participant 8, for example, for the following question:

> *Pertubuhan itu _____ (penghuluran, menghulurkan, huluran) bantuan kepada mereka yang terjejas oleh keadaan COVID-19.*
> *[The organisation extended help to those affected by the COVID-19 situation. ; Answer: menghulurkan]*

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Participant 8 explained:

> *"Pertubuhan is like, like… organisation… So they give help... I think this is like a vaccine?"*

However, when asked what his answer, "*menghulurkan",* meant, he defined it as "stretch...like, long". He concluded that the sentence was regarding a vaccine, although this detail was not found in the sentence. While he did not understand the term *menghulurkan* when asked explicitly, he had in fact mentioned "give help" in his response.

Participant 1 also inferred the meaning of this sentence, and elaborated:

> *"The COVID-19 is… more…more, uh, more cases because (so) they need more people to help."*

There was no mention of rising cases, and interestingly he did not translate *pertubuhan* (the organisation), implying that he did not know its definition.

Having the same challenge was Participant 5, who despite not knowing some words, had a clearer understanding of the sentence:

> *"The body part…pertubuhan..... Uh I don't really get the sentence… was having a...people helping? Helping people who was involved with the COVID-19."*

All of them were able to provide the correct answer. However, in communicating the meaning of the sentence, their understanding of the sentence varied slightly based on the inferences made. Participant 5, like Participant 1, was unable to define *menghulurkan* but was familiar with the common phrase *menghulurkan bantuan* (giving or extending help) and hence was able to infer the main idea of the sentence.

It is important to highlight that these were errors made at sentence level, and the participants only had to infer words within the sentence to grasp the main idea. Typically, passages in school extend beyond sentence level; the texts comprise of several paragraphs. With the exception of Participant 5, all the participants expressed challenges in answering the reading comprehension component in their school exams, as explained by Participant 3:

> *"As sometimes the word are not like… you just have to copy some words from inside there, but sometimes you cannot find it inside the paragraph."*

This comment suggests that there may be an over-reliance on answering strategies taught in schools, in order to compensate for the lack of understanding. However, this

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may not be adequate, especially when conclusions and inferences are required to be drawn based on the information in the passage. Participant 8, whom although showed during the activity that he was generally able to infer the main idea, highlighted how questions regarding details of the passage was particularly challenging. He elaborated on his difficulties:

> *"Sometimes like when they say like 'why' or 'what' will happen all that right, and right… mostly got like based on a story. Sometimes it's hard for me to find what...what is- like… why did the boy do that, or like, where is it."*

These findings suggest key information, details, and nuances may be misinterpreted, hence compounding their difficulties when attempting to comprehend the passages in school. The concern regarding the length of passages was further explored in the next section.

4.3.2. Difficulties with Long Passages

The ability to comprehend texts being dependent on the length of the passage was another opinion that was shared across all the participants, where longer passages were found to be more difficult. Participant 6 shared his perspective:

> *"I don't understand the...uh the words…Because when I see the words, then I feel like blur… I need to wear spectacles then like ya."*

He clarified that wearing spectacles did not aid his reading, but it was something that he experienced only when it came to tackling difficult components. It is important to note that participant 6 exhibited difficulties with word retrieval during the interview session, thus his choice of words were not always appropriate. However, his response implied how overwhelming passages generally were to him and how longer passages could exacerbate his difficulties. Participant 4 also lamented the length of the passage:

> *"When you see the passage, then it's like my...my head will be very crammed then I'll be lazy to read… Because, tsk, too many words."*

For Participant 5, although she did not consider the reading comprehension aspect of the language one of her main difficulties, she addressed how longer stories would make it difficult for her to comprehend, despite her strong reading ability. Reflecting on her difficulties, she detailed:

> *"Like when it gets longer, there is more problems into it."*

Participant 2 shared her concerns on longer passages, raising the issue of remembering details:

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"Because sometimes I can't remember when I read all."

These responses draw attention to the barriers that act as a hindrance in attempting to comprehend passages, making it evident as to why reading comprehension is perceived as challenging.

4.3. Perceived Usefulness and Motivations

Throughout the interview session with the participants, the researcher noted that some participants had unfavourable opinions with regard to learning the Malay language, while others viewed it in a more positive light. Thus, the researcher sought to investigate the underlying motivations and interests to examine whether this aspect had any implications on their learning of the language.

The two categories emerged here:

a) Malay as an alternate language of communication,

b) supportive learning environment

4.3.1 Malay as an Alternate Language of Communication

Six of the participants perceived the Malay language to be useful, of which five of them cited how it was useful for socializing and communicating with friends or parents. An interesting perspective was offered by Participant 7, who explained the ease of communicating with her Malay friends, where the Malay language allowed her to compensate for English words she had difficulties retrieving:

"Because when you- like… [when you're] with your Malay friend, and you don't know how to say the Malay thing in English, you can just say them to them- say the thing to them in Malay."

Although Participant 4 felt that the language was "just too difficult", he expressed the importance of being able to understand Malay in order to communicate with others. He shared his plight of having a weak command of the language, saying:

"If they expect me to answer back, then I will just stand there… [I] feel embarrassed, because I need to talk in English."

Three of the other participants also perceived Malay as a useful form of communication outside of their household and social circles. Participant 3 shared his perspective:

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> *"Like im-imagine you [are] going to a stall, but the stall owner says [it] in Malay, then you don't know how to speak in Malay. Then you in the end speak English, then the shop owner didn't know [what you meant] then you have to buy another in the [other] shop."*

It is important to highlight how none of the participants perceived Malay as an essential means of communication in Singapore, rather it was seen as a supplementary language to help them go about their daily lives. Participant 5 shared how the language allows her to communicate with family members who were not well-versed in the English language. She commented on the usefulness of the language in Singapore's context:

> *"Not really important… mostly people are talking English and Malay."*

Interestingly, both she and Participant 8 articulated how knowing the language was useful mainly for when they traveled to countries where Malay was the main spoken language.

These findings suggest that while understanding the language was beneficial, in the context of multilingual Singapore it was not central in communicating, in that not knowing the language simply meant having to rely on English to communicate, the main language used in the country – a language barrier was of minimal concern.

When asked about the importance of being able to read Malay, matters pertaining to meeting examination standards were raised by half of the participants (n=4). Participant 4, sharing how his bad grades would result in a scolding from his mum, weighed in on his views:

> *"…if I know how to read, I will know how to understand a passage and the question, then I can get the answer correct."*

His sentiments suggest that despite his challenges, he acknowledged the importance of performing in the subject and there was an expectation for him to do so. The need to do well enough to progress applied to secondary school students as well, as highlighted by Participant 8:

> *"For secondary [level], I know it's very important, and then we can like, can graduate. Then mostly like… because I want to go Sec 2, so…I pay attention in my Mother Tongue lessons... to pass my Mother Tongue."*

The general feelings from these participants reflect the emphasis placed on students to fulfill the progression criteria to the next school level.

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4.3.2. Supportive Learning Environment

With the exception of one participant, all the participants maintained a generally positive attitude towards learning the Malay language. Some of the participants attributed this to their teachers, while others cited the engaging activities that were carried out in class.

Participants who mentioned their teachers felt that they were often rendered support in areas they found challenging even for a seemingly easy task, as shared by Participant 1:

> *"She help me how to explain… how to give clue… how to do the passage."*

This sentiment was echoed by Participant 8, who found his teacher to be understanding of his learning difficulties:

> *"…maybe because like… trying to help. Like for kids like me…. to pronounce...like help ah."*

Participant 4 viewed his overall learning in the classroom through a negative lens, despite sharing that his teacher trained him well in learning the Malay affixes. He highlighted aspects he found more important that were lacking in support:

> *"If the teacher can help to translate some of the words… And the… if the teacher help to show how to spell the words."*

Based on these responses, it appears that the participants had a more positive learning experience in the classroom when they felt that extra help was provided to accommodate their specific learning needs.

Another aspect relevant to note is the esteem-levels of the students that affect their motivation to learn and do well in the language. It appeared that participants felt very discouraged when tasks got too challenging. They associated challenging tasks to be the most uninteresting aspect of learning Malay in school, as shared by Participant 7:

> *"… Like a story, after that you have to fill in the blanks. They ask you the question after that you... that one I hate that part."*

Participant 3 shared the same sentiments:

> *"The fact that uh...that sometimes teacher… my teacher give us hard question. And I couldn't solve it. Some of my classmate didn't solve it even because it was too hard."*

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This was echoed by Participant 4, who felt very strongly about this aspect:

> *"Like when I go to school, then it's always Mother Tongue, I feel like I want to go [to the] toilet and then just sleep in the toilet."*

He later highlighted this sentiment once again, citing reading comprehension activities as the main reason. Interestingly, most of the responses were in relation to comprehension-type activities as well as writing.

On the contrary, some of the participants (n=2) who held positive views about learning Malay attributed it to the feeling of achieving good grades. Participant 3 reflected on this:

> *"…It's something I like now, but then… 'cause uh...after the high marks I got, I feel like I want to try learning more Malay words. In the past I feel like I do not… I didn't want to learn Malay… 'cause I got low marks, then I feel like I [was] not that good at saying Malay..."*

This comment suggests that the interest in learning the subject was influenced by one's ability to perform well, or achieve a passing mark. Participant 5 who shared that it was one of the few subjects she would study for, provided her perspective on this:

> *"I like to score the… I like to score [in] the Malay [subject] because I don't… like, I don't score all the subjects full."*

These comments provide insight to the notion that achieving a sense of accomplishment spurs learners with dyslexia to learn the Malay language. However, when they are faced with persistent difficulties during their learning, when left unsupported, it eventually creates a barrier that prevents them from feeling a sense of achievement. Thus, their motivation is affected and, in turn, their interest in acquiring Malay.

Summary

The participants were English-Malay bilingual learners with dyslexia who revealed aspects of the Malay language they faced challenges in. Where they displayed challenges answering the interview questions, or detailing their difficulties, observations from the reading-related tests were analysed.

In the area of word reading, participants displayed difficulties with:

(a) unfamiliar words,
(b) long words and
(c) affixed words and complex syllable structures.

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This shows us that exposure to reading Malay is imperative, particularly since English is extensively used in schools and homes. The increasing length of words did not directly affect word reading, rather if a long word was unfamiliar or had complex syllable structures (e.g. digraphs and diphthongs or both), only then did it exacerbate their reading difficulties. Similarly, affixation was found to be challenging when there were digraphs or diphthongs. Observations from the reading related tasks also revealed several error types, including visual, phonetic, and errors from cross-linguistic transfers.

In the area of reading comprehension, the participants mentioned :

(a) weak vocabulary and
(b) long passages as factors that affected their reading comprehension.

Weak vocabulary here was defined as words they could not read or did not know the meaning of. The sentence comprehension task delved deeper into their difficulties and revealed their sentence comprehension to be compromised by making predictions based on the main idea of the text, along with syntactic errors that were sometimes a result of visual errors. Furthermore, most of the participants found lengthy passages to increase the difficulty level of reading comprehension tasks.

Despite these difficulties, all the participants viewed Malay as an alternative language to communicate in, and most of them showed motivation to learn the language when they felt that their needs were supported and accommodated to in the classroom.

5. DISCUSSION

5.1 Discussion

The first research question addressed the reading difficulties faced among English-Malay bilingual learners with dyslexia. There were three aspects of reading difficulties observed pertaining to difficulties with unfamiliar words, long words and words with affixes and complex syllabic structures. The single-word reading task revealed that reading words that were less familiar resulted in more errors than reading frequently seen words, where errors were largely underpinned by phonological deficits. Although non-words were not being used in this study, reading less frequently seen words beyond their level revealed non-word errors and phonetic errors. This is consistent with past studies that have investigated dyslexia in shallow orthographies (Ziegler et al., 2003; Eklund et al., 2015) and corresponds to error analysis previously done in the Malay language (Lee and Wheldall, 2011).

The non-word error suggests that the learners used a grapheme-phoneme strategy to decode the words, but were unable to string them efficiently. Interesting to note is how participants found unfamiliar words to be harder to read than longer words, suggesting that syllable-level and morpheme-level instruction in schools supports their decoding at

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larger grain-sizes (Winskel and Widjaja, 2007; Zhang, Chin and Li, 2017), but not in fine-grain sizes (Lee and Wheldall, 2011). Another interesting finding to highlight is how reading accuracy was affected in more complex syllabic structures, and when affixed words included digraphs or diphthongs. This is in line with Lee and Wheldall's findings that highlighted the complexity in the word length, rather than the affixes (Lee and Wheldall, 2011). Evidence of cross-linguistic transfer was also observed, in that participants use grapheme-phoneme mappings from English (L1) to facilitate decoding in Malay (L2).

The second research question investigated the challenges faced when comprehending texts. In the simpler sentences, participants read with ease and made few syntactic errors. However, as the difficulty level of the sentence increased, and sentences included vocabulary that were not frequently seen and or complex, errors in answering the comprehension questions were largely either semantic or syntactic. Furthermore, as the comprehension sentences increased in length, participants were observed to make more reading errors, which compromised their ability to either select the correct answer (using syntactic skills), or comprehend the text (using semantics).

Although Malay comprehension difficulties in learners with dyslexia has not been widely explored, the present study findings correspond to studies done in the French language (Casalis et al., 2004), Finnish (Torppa et al., 2012) and Greek (Constantinidou and Stainthorp, 2009) and second language learners in Spanish (Mikulek, 2015). This was observed through some of the participants struggling to apply syntactical skills in selecting a suitable affixed word, as well as the poor word decoding that affected their fluency and processing of the sentences. While the morphologically-rich nature of Malay may have facilitated their reading of the words (Carlisle, 2000, 2003; Nagy and Anderson, 2984), the syntactic errors that arose from the morphological structure of Malay words also proved to affect the accessing of semantic information of the word. This supports earlier findings that pointed out that relying on morphology alone for comprehension will not suffice (Adams, 1977; Boets et al., 2010; van Bergen et al., 2012) Poor comprehension skills was also observed through the prediction strategies used that omitted details, when asked to recall the sentence that they had just read, similar to the adult Spanish (L2) learners in Mikulek's study (2015). It is thus logical to expect that the learners found that long reading comprehension passages were more difficult to comprehend, considering the cognitive demands required to understand passages (Castles, Rastle and Nation, 2018).

The third research question addressed the perceptions and motivations of learning the Malay language as an English-Malay bilingual learner with dyslexia. Most of the participants viewed learning Malay through a positive lens, citing the importance of passing exams. Moreover, contrasting the study in Hungary among German (L2) and English (L2) learners, the interest towards learning Malay was influenced by the practicality of being able to communicate with other members in the Malay community

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(Kormos and Csizér, 2010). Even the participants who were scoring borderline pass in Malay were motivated to learn the language, which they attributed to the positive overall learning experience in the classroom. For participants who had little interest, they appeared to have felt discouraged as a result of a less supportive learning environment in the classroom. This corresponds to previous studies that investigated motivation, self-esteem and levels of anxiety in second language acquisition amongst learners with dyslexia. (Marogna, 2013; Crombie, 2000; Ganschow et. al., 1998; Krashen, 1982).

5.2 Recommendations for Future research

Building on the findings of this study, there are three recommendations to be considered for future research:

1. Conducting a quantitative study that investigates the significance of the difficulties found in the present study in relation to reading and reading comprehension

2. Adapting the present study to include a homogenous profile of bilingual learners with Dyslexia.

3. Conducting a study that focuses on the role of morphology in Malay reading comprehension in order to enhance access of syntactic and semantic skills among learners with the same profile.

4. Investigating how English-Malay bilingual learners with dyslexia perform in spelling and writing tasks.

5.3 Limitations and Implications of present study

To begin with, the ability of the participants varied, and as such, caution must be made when making generalisations from this study. The qualitative nature of the study is a limitation in itself, in that eliciting responses from the participants required a lot of probing. Some participants were more elaborate in explaining their difficulties, while others needed more prompts. As such, not every participant was able to provide a holistic view of their difficulties in the language. Although the reading-related tasks were found to provide an alternate perspective on their difficulties, there were aspects that were only observed through the tasks but not explained by the participants themselves. Another limitation of the study pertains to the profile of the participants. They were not entirely homogenous, as some participants had been in the programme longer than others, and their test performances varied in range. Finally, another limitation is in relation to the focus on reading skill and the qualitative approach in analysing their difficulties only.

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6. CONCLUSION

The qualitative multi-case study investigated the difficulties faced by English-Malay bilingual learners with dyslexia in the context of multilingual Singapore. The study sought to investigate difficulties in the aspect of reading and reading comprehension. The study also sought to investigate the perceptions these learners had towards learning Malay, considering their unique profile. Inductive analysis of findings found difficulties in word recognition to be influenced by the lack of familiarity of words, the length of words, and the morphological and phonological elements of the words. More specifically, phonological deficits were observed to underpin their reading difficulties, along with the complexity of the syllabic structures that arose with the presence of digraphs and diphthongs, which corresponds to previous research on younger native-speaking learners (Lee and Wheldall, 2011). While morphological knowledge facilitated reading of sentences, it was found to be lacking in contributing to the semantic and syntactic skills required in higher-levels of comprehension. Lastly, the practicality of using Malay as another form of communication, along with feeling that their learning needs were accommodated to and supported in the classroom were found to be an important motivating factor to learn the language.

Despite the limitations, the present study provided some important implications. Firstly, syllable-level instruction may not be sufficient in supporting bilingual learners with dyslexia due to the underlying phonological processing deficit. Although the participants did not exhibit significant errors in the reading tasks, accessing phonological knowledge to decode unfamiliar words can facilitate their reading. More so since the bilingual landscape in Singapore and the ongoing language shift may result in less consumption of Malay print and media, as well as application of the language. Secondly, in teaching reading comprehension to learners with this unique profile, explicit morpheme instruction needs to be taught to learners, particularly as a means of accessing semantic and syntactical skills, on top of facilitating reading. Furthermore, the cognitive demands of comprehension passages prove to be overwhelming for English-Malay bilingual learners with dyslexia. As such, in selecting comprehension passages for teaching comprehension skills, the length of the passage and the lexical level needs to be taken into consideration. Finally, the concern of anxiety and low self-esteem among learners with dyslexia have to be taken into account when teaching Malay, especially since the learning of a second language can exacerbate their anxiety levels. Thus, providing learners with opportunities for success and creating a positive learning experience is key in maintaining enthusiasm and interest in learning Malay.

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