

Acknowledgements

I would like to thank my supervisor Mila Vulchanova for good, solid guidance and for never letting me leave without a new article that might come in handy. I would also like to thank Hanne Lauvik and Signe Wiger at Test of Norwegian – Advanced Level (Bergenstesten) for facilitating and providing me with the materials I needed, and Sissel Jensen Nefzaoui and Nils Arne Ree for giving up some of their time to help a master's student in need of experienced L2 Norwegian raters. Most importantly I would like to express my gratitude to the individuals that allowed me to work with their texts; this thesis would not have been much without you.

On a more personal note I would like to thank my husband Ole for all the cooking, comforting and relaxing, for knowing that I could do this, and last but not least for putting up with me on a daily basis. Maren Solheim Storakaas has likewise been of much help, both academically and personally with discussions, theoretically sound feedback, walks and so much more. Lastly I would like to thank my family and friends, both from lesesal 6301 and outside in the real world, for tea breaks, for long and short lunches, for long walks, for laughs and for venting when it all became too much. You have all kept me at least somewhat sane through this process, and I promise I will have more time for you all now.

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1 Introduction

Moving to a new country, whether it be for love or for need, can pose many challenging challenges, not least when it comes to language. For some the acquisition of a new language is more challenging than for most because they have dyslexia. Much research on dyslexia has focused English-speaking school-age children. While this research has provided valuable insight into dyslexia and its causes, all results might not be directly generalizable, as dyslexia translates according to a language's orthography and typology (Goulandris, 2003; Helland & Kaasa, 2005; Lindgrén, 2012) and the behavioural aspects of dyslexia changes with age, cognitive development and education (Connelly, Campbell, MacLean, & Barnes, 2006; Goulandris, 2003). Up until now not much research has been conducted on how dyslexia affects the acquisition of a second language in adults, much less within the frame of Norwegian typology and orthography. This thesis aims to be first exploration into this area and to point to areas of interest for further research.

1.1 Research question and predictions

What can be said to characterise texts written by adult L2-learners of Norwegian with dyslexia? Is there any of these characteristics that cannot be attributed to anything but dyslexia? Are these characteristics the same as what characterizes texts written by Norwegian L1 individuals with dyslexia?

The research questions will be investigated by an analysis of six texts written by candidates, diagnosed with dyslexia in their L1, as part of Test in Norwegian – advanced level (Bergenstesten). The analysis will cover all levels of text, from spelling and vocabulary via syntax up to content and structure. Even though these texts are most likely written by well compensated adults, I still expect to find difficulties or avoidance of problematic areas in the text that can be attributed to dyslexia. At the same time I expect the texts to clearly display that they are written by L2 learners of Norwegian, and that this will be as evident in the five texts, if not more, as the effect of dyslexia.

1.2 Results

The texts were found to contain a surprisingly low number of spelling mistakes considering that they are written by writers not only with an L2 background of Norwegian, but also with dyslexia diagnoses. The analysis of areas that according to theory or research on dyslexia should pose particular challenges, also showed a fairly low number of errors. Separating

which traits and tendencies in the texts are due to dyslexia and which are due to the L2 status of the texts was challenging, particularly because of the lack of a control group without dyslexia. Some signs of fuzzy representations were found, and they are in accordance with the reigning theory in the area, but could possibly be the result of the L2 status of Norwegian. An interesting finding, however, was that all texts in this thesis present difficulty in structuring of the content, a higher-order function.

1.3 Structure of thesis

This thesis will first look into the theoretical background surrounding dyslexia. Section 2.1 looks into how dyslexia is defined, while section 2.2 looks into research on how dyslexia affects reading and writing. The thesis will then go into language learning, both normal, in section 2.3, and with dyslexia, in section 2.4, before section 2.5 considers the role of orthography and orthographic depth in dyslexia. Section 2.6 contains language descriptions of the languages in this thesis, their orthography and how dyslexia typically presents in these languages. The description of Norwegian is the most thorough, as it is the language the participants are acquiring.

Chapter 3 contains a description of how the participants were recruited through Test in Norwegian – Advanced Level in section 3.1, and section 3.2 deals with how the texts were analysed and scored, as well as the hypotheses the researcher had surrounding the results.

Chapter 4 contains the results for the 11 measures that were investigated, while chapter 5 discusses these results and proposes possible explanations based on the theory for some of them.

Towards the end of the thesis, in chapter 6, the thesis will present methodological considerations and suggestions for further research, as well as practical implications of this study. Chapter 7 will conclude and sum up the thesis. The full reference list comes after this.

2 Theoretical background

This chapter will present relevant research and theory surrounding dyslexia, language acquisition and the influence of the orthography. Towards the end of the chapter there will be a short presentation of the languages relevant to this thesis, namely English, German, Italian and Polish, with extra attention given to Norwegian, as it is the target language.

2.1 Defining dyslexia

Defining dyslexia is difficult, as there is no consensus in the field as to what is the actual cause. It is often diagnosed when there is “[...] a discrepancy between reading ability and intelligence in children receiving adequate reading tuition” (Ramus et al., 2003). This definition of dyslexia should to a large degree be abandoned in research because it is based more on schooling, behaviour and symptoms than the actual cause of dyslexia (Ramus et al., 2003). It also fails to include the written aspect of language. Bishop and Snowling argue that developmental dyslexia should be diagnosed on the basis of the underlying cognitive deficit, not behaviour on tests (Bishop & Snowling, 2004). This would mean that compensated individuals with the disorder could also be identified. What most researchers can agree on is that the cause of dyslexia is found in the brain, and it causes difficulties with certain types of learning (Lyon, Shaywitz, & Shaywitz, 2003). There have been found differences in brain structure and in neural measures during linguistic tasks, when comparing dyslexics and normal subjects, which support this (Bishop & Snowling, 2004; Lindgrén, 2012).

On the behavioural level there is agreement that dyslexia results in poor spelling and decoding skills and difficulties with accuracy and fluency in word recognition (Lyon et al., 2003; Ramus et al., 2003). The cause of this is believed to at least partially be a phonological deficit at the cognitive level, but how large a role this deficit play is a topic of much debate. The most supported view seems to be that it is the direct cause (Lyon et al., 2003; Ramus et al., 2003). Findings of impairments in “[...] encoding, decoding, manipulation and retaining of phonological information” (Lindgrén, 2012), and dyslexic individuals’ low performance in tests of phonological awareness, for example conscious segmentation, is taken as support for a phonological deficit to be the cause. Data suggesting a more basic problem with the phonological representations, such as slow automatic naming and problems with verbal short-term memory also support this (Lyon et al., 2003).

A phonological deficit as the direct cause is criticized by, among others, Pennington (2006) for being too deterministic and too focused on finding a single cause to explain what is a multifaceted disorder. Pennington instead suggests a multiple deficit model of dyslexia and other developmental disorders, in which there is no single cause, but the interaction of several risk and protective factors that can alter the cognitive functions necessary for normal development (Pennington, 2006). This model could better explain the high rate of comorbidity found in for example dyslexia and ADHD.

2.2 Dyslexia and written text

2.2.1 The connection between a phonological deficit and reading and writing difficulties

The phonological deficit found in dyslexia affects reading and writing in a phonemic alphabet by disturbing the connection between the phonemes of the language and their arbitrary symbols in print: letters. The phonological deficit works in two ways; the reduced phonological awareness makes it harder to divide the spoken word into its phonological segments, and because the phonemes are not properly stored, represented or difficult to retrieve, it is harder to access them (Brady, 1997; Lyon et al., 2003). This makes it hard both to connect a grapheme with a phoneme and to go from one to the other, particularly when faced with longer sequences, and thus it causes difficulty with reading and writing (Lyon et al., 2003).

2.2.2 Phonological and orthographic representations

The phonological deficit found in dyslexia could be the result of faulty or impoverished phonological and orthographical representations (Bishop & Snowling, 2004; Brady, 1997; Landerl, 2003). These less distinct phonological representations may give rise to difficulty with establishing mappings between phonology and orthography because these depend on fine-grained connections (Bishop & Snowling, 2004). At the same time the established representations will be functional enough to allow a dyslexic reader to identify, remember and pronounce words, but the reduced quality of the representations will result in a tendency towards less accuracy (Brady, 1997; Landerl, 2003). In support of this are findings that adults with dyslexia score lower on vocabulary measures where they need to choose between phonetically similar words, but not semantically similar words (Brady, 1997). This is taken to show that only the phonological representation of a word is affected, not its semantic representations. These same impoverished phonological representations could also partly be the source of the less precise identification and discrimination of speech found in speech

repetition tasks in people with reading disabilities (Brady, 1997). Studies have shown that there is a close link between orthographical and phonological representations, as words that are spelled close to the pronunciation are easier to store (Landerl, 2003). It is therefore likely that orthographic representations will be similarly affected.

An alternative theory is that the representations are fine, but that dyslexia disrupts the learning of the mapping between them. This could be caused either by a learning difficulty or by memory limitations wherein there is a rapid decay of activation. This would make it harder to acquire both letter-sound correspondences, letter sequences and it could also affect mapping between phonology and semantics, making acquisition of new vocabulary harder. (Bishop & Snowling, 2004).

2.2.3 Writing and dyslexia

Reading in dyslexia can become well-compensated with age and general cognitive development, but spelling is persistently a problem also into adulthood (Connelly et al., 2006, 176; Goulandris, 4; Lindgrén, 14). This can in part be due to writing being a more demanding task than reading, as it requires production as well as processing of print (Connelly et al., 2006, 176). While context cues can help decoding in reading, this is not as available in writing, in addition to there often being only one correct spelling (Frith, 1999).

Writing also poses higher demands on phonological skills than reading (Lindgrén, 2012). In the simple view of writing, transcription and executive functions are at the basis of text generation (Connelly et al., 2006). Transcription consists of handwriting and spelling skill, while executive functions are planning, monitoring, reviewing, revising, organizing and attending. Dyslexia can cause problems with transcription, both in terms of slower handwriting, the typically many spelling mistakes, and difficulties with punctuation and capitalisation (Connelly et al., 2006). The somewhat reduced capacity of the language system found in dyslexia can also be overloaded by the high cognitive demand in creative writing, leading to shorter texts and more errors (Connelly et al., 2006).

2.2.3.1 Written compositions and dyslexia

Research on the compositions of English L1 individuals with learning difficulties shows that texts written by younger writers with learning difficulties, not necessarily dyslexia, are shorter, less cohesive and qualitatively less mature than texts written by age-matched groups (Lane & Lewandowski, 1994). They also show difficulty with the mechanical aspects of

writing, i.e. spelling, capitalization and punctuation (Lane & Lewandowski, 1994). Lane and Lewandowski hypothesises that “[...] word finding difficulties, less mature vocabulary and consciously driven production of syntax may interfere with document quality and attention to ideation and fluency” (Lane & Lewandowski, 1994). In other words, the difficulties in transcription affect higher order skills.

Research into the writing process of adults and university students with dyslexia shows that these tendencies continue into adulthood. Texts written by university students with dyslexia are in some studies found to display a smaller lexical diversity, contain fewer words in total compared to a non-dyslexic control group, and more spelling errors than a spelling matched group (Connelly et al., 2006). This could be caused by constraints on memory functions, resulting in a reduced ability to cope with the same level of demand when producing text, causing transcription processes such as spelling to suffer (Connelly et al., 2006). Both essay length and lexical diversity were found to correlate with the overall essay quality, while sentence length were not found to correlate in dyslexia, but to do so for the control groups (Connelly et al., 2006).

Dyslexia is also found to affect higher-level aspects of writing, such as information structuring, which could be due to a greater tendency to focus more on spelling and other word-level issues than writers without dyslexia (Lindgrén, 2012). Other studies have not found the same effect on ideation or organisation (Connelly et al., 2006). This discrepancy can be caused by a difference in task complexity. In this often highly compensated group a significant difference might not be found between a dyslexic group and the control group unless the task is complex and involving phonological processing and orthographic skills (Lindgrén, 2012).

2.3 Language acquisition and L2-learning

Acquisition of an L1 starts in the womb, reaches a functional level at around school age and continues throughout life (Karmiloff, 2002). The acquisition of a second language, an L2, is different from L1 acquisition in that there are not only processes of construction, but also reconstruction involved (Ellis, 2013). The L2 learners are seeking to understanding a new language, but they do so with the background knowledge and strategies of their L1 (Ellis, 2013). This means that Learning an L2 is not free from influence from the L1. The influence from an L1 on the acquisition of an L2 has been known as transfer. Transfer is often

described as a process through which “[...] the learner transfers patterns, structures, rules and elements from the native language to the target language system, and that this transfer results in deviations from the target language norm, i.e. language mistakes” (Abrahamsson, 2009, my translation). This definition of transfer has been criticized for being too narrow. The term cross-linguistic influence is instead preferred in some newer literature. This term is more neutral, whereas the term transfer is often seen to be negatively loaded and focused on language mistakes rather than facilitation. Cross-linguistic influence is also more open to all types of influence, from an L2 affecting the acquisition of a second L2 or indeed L2 influence on an L1 (Husby & Kløve, 1998; 28).

There is found evidence of transfer or cross-linguistic influence in all language levels from phonology, morphology and syntax up to pragmatics, semantics and cultural competence (Treffers-Daller & Sakel, 2012). Recent research by Farukh and Vulchanova indicates that being literate in a deep L1 can facilitate spelling skills in a deep L2. This could be due to a transfer of strategies (Farukh & Vulchanova, 2014 under review).

To what degree a language will influence the acquisition of another language will vary depending on many factors. It will have a different effect depending on language level, and the level of competency in the languages. The linguistic distance, both real and perceived, between languages can also affect the acquisition of forms and structures, and smaller differences can become a bigger problem than larger ones, as smaller differences might be more difficult to notice than larger ones (Abrahamsson, 2009, 242-247).

Cross-linguistic influence can also show itself in the absence of a structure. When faced with a structure that is perceived as difficult, learners of a language tend to either avoid or underproduce it. Avoidance of certain structures is a conscious strategy, used primarily because of uncertainty or a low level of automatism, wherein the structure is seldom used and only very carefully. This means that the structure can be produced correctly in every instance, albeit not in all places where it would be found in L1 use. Underproduction on the other hand is unconscious, and the structure is rarely used due to low competency or because the interrim language has not acquired the rule as of yet (Abrahamsson, 2009).

2.4 Dyslexia and L2 learning

The effect of dyslexia on foreign language learning is hard to predict, as the symptoms of dyslexia change over time due to cognitive development and the use and development of compensatory strategies. The symptoms also differ between different orthographies and language typologies (Goulandris, 2003; Helland & Kaasa, 2005; Lindgrén, 2012). Whether an error is due to dyslexia or the acquisition process is another problem that complicates the picture. This means that the age of the dyslexic individual, the L1 orthography and typology and L2 orthography and typology must all be taken into consideration. The sum of the problems experienced with language learning due to dyslexia can also affect the motivation to learn a second language.

2.4.1 The role of the L1

There is an assumption that “successful foreign language learning is founded upon phonological, orthographic and syntactic skills in the native language”, and that any L2 difficulties can be traced back to the transfer of strategies and skills from the L1 (Miller-Guron & Lundberg, 2000). A deficit could thusly affect L2 acquisition adversely. Dyslexia impedes L2 learning at the initial stages, by disrupting the phonemic coding ability. This is an ability that is vital in early L2-learning, as it helps understand and select which input is worth processing. If an individual is incapable of analysing auditory input in the form of speech into phonemes and then on to morphemes, input may not result in intake (Saville-Troike, 2012).

While L1 experience, training and efficient compensatory strategies can hide deficits caused by dyslexia in the L1, these deficits can resurface and become very visible in a foreign language. This can be due to the L1 compensatory strategies being less efficient in the L2, in addition to less training and experience in the L2 compared to the L1 (Lindgrén, 2012).

Many of the processes mentioned above that are compromised in dyslexia could also disturb the acquisition of an L2.

2.4.2 The role of comprehension

Comprehension seems to play a large role in determining how severely the symptoms of dyslexia will surface in an L2. Helland and Kaasa divided a group of dyslexic Norwegian L1 children into two groups based on their score on an English comprehension test, namely good comprehension of English and low comprehension of English. They found that the Norwegian L1 individuals with dyslexia and a good comprehension of English scored on par with the control group on all verbal tasks except morphology. They were also significantly better than

the group with low comprehension in reading and translation, but still well below the control group. The two dyslexic groups had equally low scores for spelling regardless of comprehension, but the group with low comprehension had a low score on all measures. They had a particularly slow word processing, which can be due to a limited vocabulary, a deeper processing impairment or both (Helland and Kaasa, 2005). There is still an open question as to whether it is the level of comprehension that lessens some of the burden of dyslexia or if it is the severity of the dyslexia that hampers comprehension and thus proficiency. Helland and Kaasa's group of individuals with dyslexia and a low comprehension of the L2 English must not be confused with poor comprehenders, which is a separate deficit from dyslexia, wherein decoding is not a problem, but comprehending what is decoded is (Bishop & Snowling, 2004).

Lindgrén, who looked at Finland-Swedish dyslexic high-achievers, found no difference in the reading comprehension test and on free writing length in English as a foreign language between the dyslexic group and the non-dyslexic group at all (Lindgrén, 2012). There were however other differences between the groups, and the dyslexic difficulties surfaced the most in reading and writing accuracy in the least proficient language, namely English (Lindgrén, 2012). These results could also be affected by English being a language taught in school, a setting that strains memory functions already compromised in dyslexia, in addition to less input and perhaps also quality of input (Helland & Kaasa, 2005).

2.5. Orthographic depth

Orthographic depth and consistency refers to the predictability of a language's sound to letter-mapping and letter to sound-mapping. Shallow orthographies are spelled phonetically and have predominantly 1:1 correspondences between letters and phonemes, while deep orthographies have more complex mappings, such as one sound being represented by many different letters or letter combinations (Seymour, Aro, & Erskine, 2003; Ziegler & Goswami, 2005). Multi-letter graphemes, the use of context dependent rules, amount of irregularities and direct representation of morphemes, regardless of pronunciation can also contribute to the orthographic depth and inconsistency of a language (Seymour et al., 2003). Smaller grain sizes tends to be more inconsistent than larger ones (Ziegler & Goswami, 2005)

The deepness of this inconsistency in an orthography can either go from graphemes/letters to phonemes (reading) or from phonemes to graphemes/letters (spelling) or both, as the so-called bidirectional inconsistency of English (Ziegler and Goswami, 19).

Orthographic depth has been shown to affect the acquisition of both reading and writing. Compared to shallower orthographies reading is delayed by as much as two years in some estimates in deeper orthographies, possibly due to different reading strategies being employed (Seymour et al., 2003; Wimmer & Goswami, 1994). The acquisition of spelling is also shown to lag behind reading in deep orthographies (Ziegler & Goswami, 2005).

In addition to orthographic depth, the complexity of the syllable structure is found to enable or hinder reading acquisition. Non-word reading is facilitated and the lexicality effect is low in languages with a simple syllable structure, while a combination of deep orthography and complex consonantal clusters gives poor non-word reading and a high lexicality-effect (Seymour et al., 2003).

2.5.1 Orthography and dyslexia

The biological, neurological and cognitive core features of dyslexia seem to be the same across languages, but the prevalence varies according to country and language (Ziegler and Goswami). This difference can be ascribed both to variances in diagnostic criteria and to the variation in orthographic depth (Lindgrén, 2012). A deep, inconsistent orthography gives more room for error for all groups, but it in particular intensifies the behavioural aspects of dyslexia, making it easier to discover otherwise mild cases of dyslexia. At the same time the degree of impairment relative to controls is found to be similar across languages and orthographic depth, strengthening the assumption that there is a universal basis for dyslexia (Paulesu et al., 2001; Ziegler, Perry, Ma-Wyatt, Ladner, & Schulte-Körne, 2003).

As a general rule reading in dyslexia in deeper, inconsistent orthographies is characterized by inaccurate decoding and slow reading, while in more transparent, consistent orthographies reading is different in terms of speed and effort rather than poor accuracy. The difficulty with spelling lies in producing spellings that are orthographically legal, not just viable (Lindgrén, 2012; Szczerbinski, 2003; Ziegler et al., 2003). In moderately transparent orthographies, like Norwegian, there is both impaired accuracy and reduced reading speed, but to a lesser extent than in deeper orthographies (Lindgrén, 2012).

2.6 The languages in this study, their orthography and dyslexia

I will describe the relevant parts of the participants' L1s, English, German, Italian and Polish that are relevant to orthography and this thesis. Norwegian will be described in more depth as

it is the target language. For a comprehensive description of the Norwegian language see for example Hagen's *Norsk referansegrammatikk* (1997).

2.6.1 Norwegian

Spoken Norwegian is divided into many regional dialects, and there is a wide acceptance for using these dialects not only in everyday life but also at school and work, as well as on television (Språkrådet, 2001). These spoken varieties of Norwegian differ from each other in pronunciation, prosody and lexical content, as well as in certain syntactical structures (Åfarli, 2006). Giving a description of the Norwegian language is therefore in many ways difficult, as there is no single variety that is normed as standard or more appropriate. An often frustrating side-effect of this for second language learners of Norwegian is that the norm is to not include pronunciation guides in dictionaries¹. What I will present here will be a rendering of the variety in most common use at entry level Norwegian courses, Standard Eastern Norwegian, the dialect of the capital area (Husby, 2010).

2.6.1.1 The Norwegian language

Norwegian is often described using around 40 IPA symbols. It contains many vowel phonemes, most notably many rounded frontal ones, and many high ones. In addition to this vowel length is a distinctive feature, as in *pen* /pe:n/ (pretty) and *penn* /pen/ (pen) (Kulbrandstad, 1993). This difference also results in a change in vowel quality, for example [pe:n] and [pen], thus leading some phonologists to describe Norwegian as having 18 vowels, even though it is the length of the vowel, not the subtle quality change, that is considered distinctive. Norwegian also has around six diphthongs. In the Oslo variety there are five retroflexes /ʃ/, /ŋ/, /dʒ/, /tʃ/ and /ʎ/. These sounds frequently, but some of them not exclusively, occur when an [r], <r>, meets a dental sound. Retroflexes are used in dialects that do not have an uvular r (Kulbrandstad, 1993).

The Norwegian syllable can have a maximal onset of three consonants and a coda of maximum four consonants, as in the adjective *sprelsk* /sprelsk/ (frisky, lively, unruly) (Husby, 2010). As typical for Germanic languages, Norwegian has numerous closed CVC syllables, and the use of complex consonantal clusters in both onset and coda is common (Seymour et al., 2003).

¹ A notable exception is the online dictionary LEXIN, which is especially aimed at L2 learners. This dictionary can be found by googling lexin or at <http://decentius.hit.uib.no/lexin.html?ui-lang=nbo>

Norwegian evolved from the synthetic Old Norse into a slightly more analytical language, still containing much inflection (Åfarli, 2006). Nouns are inflected by morphemes in singular and plural and definite/indefinite. They are in congruence with one of the three grammatical sexes, which also demand the conjugation of adjectives and pronouns (Helland & Kaasa, 2005). Verbs are not conjugated for person, but are conjugated for tense. There are four main classes of verbs, plus various irregular ones. Norwegian morphemes are generally agglutinating in nature, in which affixes are attached to the stem of the root morpheme:

Noun: *mann* – *mannen*. (man – the man)

Verb: *Å sitte* – *sitter* (to sit – sits)

However, there are also many examples of internal conjugation, where the morpheme is fusional, often denoting more than one thing, as in *menn* where the vowel shift denotes both plural and indefinite. This form of cumulative affixes is not the norm, both not uncommon in Norwegian either (Åfarli, 2006).

Noun: *mann* – *menn*. (man – men)

Verb: *Å sitte* – *satt*. (to sit – sat)

A more analytic trait of Norwegian is the restrictive word order. Norwegian is a an SVO language, and in addition there is V2 in main clauses, meaning that fronting of a constituent other than the subject leads to subject – verb inversion. OVS is therefore possible in Norwegian, but it is not the unmarked word order.

SVO [Alle i klassen_{SU}] likte_V sjokolade_{DO} *Everyone in the-class liked chocolate*

OVS Sjokolade_{DO} likte_V [alle i klassen_{SU}] *Chocolate liked everyone in the-class*

A marked feature of Norwegian syntax is that the placement of sentence adverbials differs from main clause to sub-clause. In main clauses the order is SVSaO, while it is SSaVO in sub-clauses.

Main clause Ola_S kysset_V ofte_{Sa} Kari_{DO} *Ola kissed often Kari*

Sub-clause ... at [Ola_S ofte_{Sa} kysset_V Kari_{DO}] *... that Ola often kissed Kari*

2.6.1.2 The Norwegian orthography

As with pronunciation there is more than one acceptable way of writing Norwegian. Norwegian has two official written languages, bokmål and nynorsk, and thus two different orthographies. For the purposes of this thesis I will focus on bokmål, as this is the written

norm the participants have learned, and there are nothing in the texts that indicates that they have any formal training in nynorsk.

Norwegian Bokmål, henceforth Norwegian, is normally characterized as a semi-transparent language, a 3 on a scale from 1 to 5 (Helland & Kaasa, 2005, 43). Some examples of why Norwegian is at the deeper end of the spectrum are the long compound words, the amount of irregular conjugation, particularly for verbs, and the agglutinating nature of the conjugation morphemes (Helland and Kaasa 2005; Husby 2013 course materials). Other reasons will be more thoroughly explained below.

Norwegian is written with an alphabetic writing system. The alphabet contains the same letters as the English one, with three additional vowel letters: *æ*, *ø* and *å*. The four letters *c*, *q*, *x* and *z* is usually only used in loan words. Together these 29 letters and around 36 additional graphemes are used to represent the about 40 phonemes commonly used in Norwegian (Hagtvet & Lyster, 2003, 182). The orthography is based on the orthophone principle, in which pronunciation guides spelling, and is thusly mostly regular and accessible through a phonemic approach, even though it is far from the ideal 1:1 correspondence of a shallow orthography (Helland & Kaasa, 2005; Kulbrandstad, 1993). The deepness of the orthography related to spoken language will of course vary depending on dialectal varieties, as some are quite close to and directly affected by the standard orthography while others are not.

There are also several areas of Norwegian orthography that does not neatly follow this principle, making the Norwegian orthography somewhat deeper. Many Norwegian phonemes are not represented by a single letter, for example are the retroflexes, /ŋ/ and /ç/ frequently represented by digraphs. Many phonemes also have an unstable mapping, while others are fairly systematic.

One example of the more systematic variation is /u/ and /o/. /u/ is spelled using <o> in many words, but as <u> when followed by <k> + another consonant, <-ng-> or <-nk->. <u> is also common before <m(m)>. /o/ is the pronunciation of both the infinitival marker <å> (to) and the conjunction <og> (and). Other than this /o/ is spelled as <o> in many words, but as <å> in others (Kulbrandstad, 1993).

/f/ has a less systematic and more complex phoneme-grapheme relation, with a one-to-many mapping. It is also spelled differently according to its position in the word and in the syllable and can be represented by at least 18 different graphemes, ranging from one letter up

to three (Husby, 2010). One reason /ʃ/ is very unpredictable are the many loan words, such as *crescendo* and *charter*, which keep their original spelling (Kulbrandstad, 1993).

	Grapheme	Example
Onset	<Skj>	<u>sk</u> jønn, av <u>sk</u> jed
	<Sk>	<u>sk</u> i, <u>sk</u> øyte
	<sh>	<u>sh</u> erry, <u>To</u> shiba
	<s+l>	<u>s</u> lem, be <u>s</u> lutte
	<j>	journalist
	<g>	rangert, geni
coda	<rs>	mar <u>s</u> , personlig
both	<ch>	nach, <u>ch</u> arter
	<sj>	<u>s</u> jel, tu <u>s</u> j
Less frequent		gård <u>s</u> bruk, mar <u>s</u> j, mar <u>sh</u> mellows, nysg <u>j</u> errig, <u>x</u> erox, <u>sch</u> æfer, <u>c</u> rescendo, <u>ts</u> jekker, be <u>ig</u> e

The spelling of /ʃ/ is one example where Norwegian prioritizes the etymologic principle, in which words are spelled to show their language origin, over the orthophone principle. This is not only true for some recent loan words, but also for words and morphemes that stem from Old Norse (Husby, 2010). Some examples are frequent words and morphemes such as *land* /lan/ (land), *gjøre* /jø:re/ (to do), *hvorfor* /vurfor/ (why), *artig* /aʃi:/ (fun), and the definite form singular morpheme neuter nouns: *eplet* /eple/ (the apple) (Husby, 2010; Kulbrandstad, 1993). This has led to many silent or superfluous letters, and also to some homophones not being homographs, such as *hjul* /jʉ:l/ (wheel) and *jul* /jʉ:l/ (Christmas).

Another orthographic phenomena that complicates Norwegian orthography is the so-called “interrelation rule”. It is similar to the etymological principle only instead of showing wordrelation diacronically, it shows synchronic relations between words. Some inflection or derivation causes differences in pronunciation, for example because of assimilation, but to show the relationship between words the spelling from the basic, unconjugated form is retained throughout. One example is the word *trygt* /trykt/ (safe). It is the neuter form of the word *trygg* /tryg/, but to show the relation between the words the <g> is retained, causing orthography to differ from the spelling (Husby, 2010; Kulbrandstad, 1993).

2.6.1.3 Spelling rules relevant for this thesis

Orthographic representation of vowel length is also not consistent. The main rule is that a short, stressed vowel sound is marked by two or more consonants following it. When only one consonantal sound follows a short, stressed vowel this consonant is doubled, an orthographic phenomenon commonly called a “double consonant” in literacy training (Kulbrandstad, 1993). This means that to decode whether a stressed vowel is short or long, one must look at the following consonant(s). Double consonants thus mark vowel length.

Some exceptions to this rule are <v>, which is not doubled; <m>, which is not doubled at the end of words; and many frequent, short words, for example *man, at, hos, kan, men, nok, skal, til, vel, vil*. Some of these words can form part of a compound, such as *likevel*. Due to the etymological principle some loan words are also spelled without doubling the consonant, like *negativ* and *infinitiv*, while others are spelled with a double consonant, even if the syllable is not stressed, like *attest* and *abonment* (Kulbrandstad, 1993).

Simplification of double consonants happens if the consonants meet any conjugation morpheme that starts with a consonant or some derivational morphemes that begin with a consonant:

Eventuell – eventuelt *Bygge – bygde* *Å redde – en redning*

Again there are exceptions, mostly to keep words of different origins and pronunciation separate, such as *visste* /viste/ (knew) – *viste* /vi:ste/ (showed), and *fult* /fu:lt/ (ugly/angry neuter form) – *fullt* /fult/ (full, neuter form).

Compound words are very common in Norwegian, and is commonly written with no whitespace. If a word is pronounced with one main stress and a secondary stress, then it is a compound. A compound word misspelled with whitespace not only signals a different pronunciation, but can also significantly alter the meaning (Kulbrandstad, 1993). One good example is <røykfritt> /'røyk,frit/ (no smoking zone) and <røyk fritt> /'røyk 'frit/ (smoke freely).

Capital letters are used for the first letter of proper names and the first word after a full stop. Public institutions also receive a capital letter, but authorities, komitees et cetera, does not (Kulbrandstad, 1993).

When to use *og* and when to use *å* can be a challenge for many during literacy training in Norway, and indeed continues to be challenging for some well into adulthood. This is partly

because the words are pronounced the same in most of Norway, except for in slow careful speech. Å (to) is the infinitival marker, and *og* (and) is the connective conjunction (Kulbrandstad, 1993)

2.6.1.4 Dyslexia in L1 Norwegian

Typical signs of dyslexia in Norwegian are slow silent reading and/or reduced text comprehension. For oral reading it is common to find reversals of letters/graphemes, abbreviations of long words and misreading or exclusion of inflectional suffixes. In writing oblique words are often spelled phonologically, compound words are split up, rules for single and double consonants are violated and punctuation may be incomplete (Helland & Kaasa, 2005)

Hagtvet and Lyster looked into the spelling of good and poor decoders in Norwegian and found that both groups have problems with the same types of words, but that the problems were greater for poor decoders than for good decoders. Factors that determined whether or not there were problems were a lack of familiarity, the orthographic complexity, the presence of consonant clusters, word length and irregularity (Hagtvet & Lyster, 2003).

2.6.2 English

English is a West-Germanic language that is closely related to Norwegian. English does not have any rounded, frontal vowels or retroflexes, but it does contain an unvoiced postalveolar fricative: [ʃ] (Weinberger, 2014). Syllable structure is similar to the Norwegian one in many ways: as Norwegian the maximal syllable can contain three consonants in the onset and four in the coda, and there are many closed syllables (Kuiper & Allan, 1996; Seymour et al., 2003).

English is a very deep orthography, with a bidirectional inconsistency meaning that there is inconsistencies both from grapheme to phoneme as well as from phoneme to grapheme (Ziegler & Goswami, 2005). Only three consonants are represented by a single letter and no other combinations, namely <n>, <r> and <v> (Thorstad, 1991). Grapheme -phoneme consistency for vowels are particularly unreliable (Landerl, 16). This is partly due to English relying on the etymological principle, in which spellings are based on word origin over pronunciation, leading to many homographs as well as many homophones (Thorstad, 1991). This means that while smaller grain sizes can be wildly unpredictable, larger grain sizes are more consistent than smaller ones, particularly in morphology (Ziegler & Goswami, 2005).

Compound words can be spelled with both whitespace, hyphen or no whitespace, sometimes only one option is orthographically valid, other times a word can be spelled correctly in all three ways. Perhaps as a result of the oblique orthography reading instruction gives more emphasis to whole-word recognition and less to phonological decoding abilities (Landerl, 17)

Dyslexia in English tends to manifest itself in slow and inaccurate reading, as well as a spelling difficulty, skills significantly lagging behind reading skills (Connelly et al., 2006; Goswami et al., 2011; Ziegler & Goswami, 2005). It is possible that the acquisition of such a deep orthography as English actually requires a different approach to processing of printed words, which is both alphabetic and logographic (Seymour et al., 2003). Such a dual process could explain why acquiring sufficient literacy skills takes longer time for children acquiring English, and affecting dyslexic children to a greater degree, as both attention and processing would be divided between the processes (Seymour et al., 2003).

2.6.3 German

German is a West-Germanic language closely related to Norwegian, and the two languages share many cognates. German is a SOV-language with V2, meaning that positive transfer of syntax is possible (Åfarli, 2006). It is rare that vowel length is the only difference in German, but there are some cases (Landerl, 2003).

The phonetic inventory of German is not so different to Norwegian. German has frontal rounded vowels such as [y], [ø] and [œ], which, even if slightly qualitatively different, are comparable to some of the Norwegian vowels (Weinberger, 2014). There are no retroflexes, but the unvoiced postalveolar fricative [ʃ] is used.

On a scale from 1, Finnish, to 5 English, German is a 2, meaning that it has a fairly shallow and consistent orthography. With the exception of <v> which is usually pronounced /f/, but can be pronounced /v/, each grapheme corresponds to only one phoneme. Grapheme-phoneme correspondences for vowels are as consistent as for consonants (Landerl, 2003). The representation of vowel length is slightly more complex. A long vowel can either be marked by a doubling of the vowel-letter or by adding a silent h. As in Norwegian it can also be marked by being followed by a single consonant, as a double consonant often signifies a short vowel (Landerl, 2003). German syllables can, as in the Norwegian, contain complex consonant clusters in both onset and coda, and tend to be closed (Seymour et al., 2003)

Reading instruction in German is based on word recognition via phonological decoding, with an emphasis on teaching letter-sound correspondences, blending and the sounding out of words (Landerl, 2003).

Dyslexia in German typically presents with less fluent and automatized reading compared to non-dyslexic individuals, but already early in reading development most grapheme sequences can be decoded. There are also spelling difficulties, particularly the spelling of voiced and unvoiced stop consonants (Landerl, 2003).

2.6.4 Italian

Italian is an Indo-European, Romance language, with a continuum of varieties used from standard to regional to local. It is possible that as much as half the population do not use standard Italian as L1 (Lewis, 2013).

Italian is an SVO-language with seven vowels, but no phonemic vowel length difference. /ʃ/ is included in the phonemic inventory, but none of the Norwegian retroflexes are used (Lima, 2007). Italian, as most romance languages, tend to have predominantly open CV syllables, with few syllable clusters (Seymour et al., 2003)

Italian has a shallow orthography, in which the grapheme-to-phoneme correspondence is fairly regular, but there is some ambiguity in the phoneme-to-grapheme correspondence. This means that when reading there is little ambiguity as to pronunciation, but when writing there can be several phonologically viable ways of spelling a phonological string, but only one is correct (Angelelli, Notarnicola, Judica, Zoccolotti, & Luzzatti, 2010). Some letters have only one pronunciation, while *c* and *g* have several, depending on the following sound. These letters are also part of digraphs like *ch-* and *ci-*. Vowels vary only to some extent according to its position in the syllable, and there are no vowel digraphs (Thorstad, 1991). Italian also has double consonants, but they signify a geminated (doubled) sound, and have nothing to do with vowel length. In addition to this there are a few irregular words and homophonic words, but not homographic words (Barca, Burani, Di Filippo, & Zoccolotti, 2006). The spelling of foreign words and loan words are adjusted to Italian orthography (Thorstad, 1991).

Dyslexia in Italian is often signified by slow and effortful reading, but relatively preserved accuracy (Barca et al., 2006). A spelling deficit is often visible in words with an unpredictable

spelling and in words that require the application of complex conversion rules. The spellings are often phonologically plausible. Spelling, as well as reading, usually becomes better with age and schooling.

2.6.5 Polish

Polish is a Western Slavic language, with an SVO basic word order (Lewis, 2013). It is an inflectional language, which expresses the relationship between words in a sentence by inflecting the words, often by adding a suffix, but also by altering the stem. This means that the phonological and visual word forms varies a lot, and that words tend to be polysyllabic and slightly longer than what is common in English (Szczerbínski, 2003). Polish is also a syllable-timed language, with fixed word stress on the penultimate syllable.

Polish contains eight vowels, six short oral and two nasal, and at least 28 consonants (Szczerbínski, 2003). There are no retroflex consonants, but the unvoiced postalveolar fricative [ʃ] is included (Weinberger, 2014). There are numerous consonantal clusters, that can be up to four consonants long in both onset and coda, making them somewhat more complex than Norwegian consonantal clusters. Open syllables are the most frequent.

Polish is written with an alphabet that resembles the other alphabets in this thesis. Its alphabet consists of 32 letters, of which 23 are found in the English alphabet. The Polish alphabet excludes *q*, *v*, and *x*, but adds nine diacritised letters, like the two nasal letters *ę* and *ą*. There are also 7 digraphs that represent fricatives and affricates (Szczerbínski, 2003).

Polish has a very high consistency for reading, meaning that almost all strings, also pseudowords, can be read in only one way. (Szczerbínski, 2003, 72). There are also practically no exceptional spellings or homographs, and the context will often disambiguate pronunciation where there is doubt. While reading is consistent, this is not the case for spelling, as most words can be written down in several phonetically plausible ways. Bigger grain sizes, as in English, tend to be more consistent, as morphemes are spelled the same, even if pronunciation differs according to phonological rules like assimilation, final devoicing and cluster reduction. Homophones are infrequent, but do occur.

Literate training is phonics based, starting with letter-sound correspondences, then reading syllable by syllable until wholeword recognition is attained (Szczerbínski, 2003, 73). Writing starts 1 year after reading, at age 7, and the importance of accurate spelling is stressed throughout the school system. There is explicit teaching of orthographic rules grammar from

1st to 5th grade, and phonological awareness exercises are common in kindergarten (Szczerbínski, 2003).

Dyslexia in Polish is typically seen as a written language disorder rather than reading disorder (Szczerbínski, 2003). This is probably because reading with dyslexia in Polish involves very accurate, albeit slow, reading, also for previously unknown words and pseudowords. Moreover reading problems tend to lessen with age and education. In writing dyslexia manifests in difficulty with semantic word substitutions (guessing), gross word distortions, reversals of words and letters, letter substitutions, omissions of diacritics, confusions of suffixes and poor punctuation (Szczerbínski, 2003). The errors are often phonetic meaning that they sound right, but they often disregard higher-order spelling rules.

3 Methods

This chapter will outline how participants and materials were collected and how the material was analysed and scored. It will also present the hypotheses and expectations of the researcher to the material.

3.1 Participants and material collection

3.1.1 Test of Norwegian – Advanced Level (Bergenstesten)

The informants in this study were recruited through their participation in the written version of test of Norwegian – Advanced Level (Bergenstesten) (for more information on the participants, see 3.1.2). This is a test that is prepared and administered by Norsk språktest, a cooperation between UiB and Folkeuniversitetet. It consists of two independent tests, one oral and one written. The written test is required for people who have graduated from secondary schools outside of Norway and Scandinavia and want to apply for admission at a Norwegian university or college. This means that there are also a limited number of native speakers of Norwegian taking the test. In addition many people take the test to document their language skills in Norwegian for job-purposes. This means that there is a possible bias in the material, as many of the candidates for this test are seeking higher education and are thus not adverse to schooling. They might also have extensive experience with academia and thus might have some compensatory strategies already in place.

The written form of the test consists of five parts, which are taken over the duration of one day. Part one to three tests reading comprehension, listening comprehension and summary writing based on a short interview played from a CD. There is then a 30 minute long break, before part four and five of the test. Part four is a fill-in-the-gap-test that tests grammar, vocabulary and expressions, while five is writing - composition. The whole test takes 5 - 6 hours in total, 2 ½ hours for each part. In the last part of the test the candidates decide how much time to spend on each subpart freely.

The texts in this thesis are from part 5 writing – composition. The test participants are to write an argumentative text of around 350 words, in which they first present the issue objectively and accurately and then communicate and argue for their own view in the matter. The candidates are provided with extra information that they may use in their text. The text is evaluated on as to what degree it is a coherent and well-structured text, shows a broad and

nuanced vocabulary, an accurate sentence structure and grammar and a variation of phrases and subordinate clauses, as well as spelling and punctuation (Folkeuniversitetet, 2014a).

The test of Norwegian – advanced level offers two possible adaptations of the test for candidates with a dyslexia diagnosis (Folkeuniversitetet, 2014b). Candidates that can present a diagnosis can either receive 30 minutes extra time for each part of the test, a total of 60 minutes, and a normal evaluation, or they can receive the same extra time and have an adapted evaluation, in which the sensor takes the diagnosis in to account. The test diploma will show this to be the case. In addition candidates with a dyslexia diagnosis may apply to use a computer without a spelling program. Half the text in this material is written on a computer, namely text E, N and R.

3.1.2 Informants

A informed consent form, which was prepared by the author and approved by the NSD, was sent by Norsk Språktest to all test participants that had had an adapted test due to a dyslexia diagnosis since 2011. Six people responded, resulting in the this thesis' material of six written texts.

The participants have a varied L1 background. Participants were asked to write down their native language(s) on the consent form. Two participants reported this to be English, while the last four reported their mother tongues to be Polish, German, Italian and Norwegian respectively. This yielded a group of five informants and one control. The texts were assigned an arbitrary letter code so not to bias the independent raters. Text A and R were written by L1 English speakers, text I by the L1 German speaker, text M by the L1 Polish speaker, text N by the L1 Italian speaker and text E by the L1 Norwegian speaker.

3.2 Test procedures, scoring, statistical analyses and hypotheses

The scanned versions of the texts were typed up into a word document, preserving spelling, crossing-outs et cetera. All errors in the text were identified compared to standard Norwegian and then registered and codified for each text. I then looked at how these errors or lack of errors can be explained, both from a dyslexia perspective and an L1-transfer perspective.

An in-depth analysis of the texts was carried out to assess the general nature of the texts. Total number of words in each text and in each sentence was counted. As to essay length and word

count all texts are expected to be within 10% of the target 350 words, because this is not a free writing task, and this length is specified in the task.

Lexical diversity was measured in two ways. The first was to count the number of words and lexemes with 7 letters or more, as was done in Lane and Lewandowski (1994). The second was the total number of different lexemes in the text, divided by the total number of words in the text. When counting words, each conjugation and spelling was counted, meaning that *barnet*, *barnets*, *foreldre* and **foreldere* were counted as four words. When counting lexemes conjugations and different forms of spelling were counted together, and the above-mentioned words would be counted as two lexemes; *barn* and *forelder*. This was done to get an overview of how great the variation truly was, and to not reward varying spelling or grammatical variation in a vocabulary measure. Crossed-out words have not been included in any of these measures.

The choice to implement two separate test was made because I could find no record of the seven-letter test being used in a Norwegian setting. The arbitrary limit of seven letters might not be as successful a measure for Norwegian due to the use of compound words and agglutinating morphemes, and I thought it would be interesting to compare the results of this test with the total number of words and lexemes. I suspect that text I, German and text M, Polish will have a high number of words over seven letters due to L1 transfer. I also expect the two tests to yield similar results.

Of special focus when it comes to spelling are words in which the spelling differs from the pronunciation to a greater degree than what is normal in Norwegian, and areas that have been shown to be challenging for L1 Norwegians with dyslexia. All words that contain or should contain an assimilation, silent letters, the sound [j] or a consonantal cluster of three or more consonants have been registered. The choice to look at consonantal groups of three or more have been taken because these should pose a greater challenge than a consonantal cluster of two. Signs of difficulty in all of these areas was expected for all of the text, but less difficulty with consonantal structures for text I, German, text A and R, English and text M, Polish, because of positive transfer from L1. Vowel length, as represented in the orthography by double consonants, and punctuation and capitalization was also registered, as these are areas that are found to be difficult for Norwegian L1 speakers of dylexia. Norwegian's many marked vowels could be extra challenging for dyslexic individuals, and assimilation, double consonants and vowels are all areas that could be affected by a phonological weakness.

The number and frequency of compound words are also registered. Compound words have been selected because they are shown to be a problem in L1 Norwegian dyslexia. Compound words not only tend to be long, giving a greater processing load, they also consist of at least two roots, meaning that fuzzy representations might have a greater impact. Consonantal clusters also often arise across word boundaries in Norwegian. I expect the number and use of compound words to vary greatly according to L1-background, but that all texts will show avoidance or difficulties with compound words.

For syntactic complexity I have looked at the frequency and correctness of V2 and inversion in the sentence structure, as well as the use of sentence adverbials. I expect to find great difficulty and avoidance in this area, as this is very common in Norwegian as a second language, due to cross-linguistic influence from the L1.

The over-all quality of the texts were assessed by two experienced Norwegian as a Second Language teachers at NTNU, who were both blind to the nature of the study and the texts L1-background. One of the raters have extensive experience in grading candidates for Test of Norwegian – advanced level. They were asked to rate the texts in two categories; communication/structure and content. Rater 1 did this, but rater 2 did not. Both used a scale from A to F, A being the highest grade. The raters was told that these were texts from Test in Norwegian – advanced level, and that they were written in approximately 1-2 hours. Both were informed that the texts should first present the topic, and then present their own views and support them. I expect that the lower skills have affected ideation, presentation etc. placing the overall judgement in the lower end of the scale. I also expect them to stay low when asked to look away from spelling.

4 Results

4.1 Text length

All participants except text I, German, were within the target of 350 words (315 – 385 words is an appropriate range). Text I is only 286 words, of the target with 18%. The other texts varied from 344 to 383 words.

4.2 Sentence length

The average sentence length ranged from 13,68 – 18,15 words per sentence for the L2 candidates, whereas the Norwegian L1 had an average of 24,73. The shortest sentences were all around 5 words, while the longest were between 29 and 35 words for the L2 candidates and 63 for the L1 candidate.

4.3 Lexical diversity

Over-all the two tests agree to a large degree. The two tests for lexical diversity place four of the six texts in the same order, with text M clearly being the lexically most diverse, and text A as the least diverse. The seven-letter test places text I in second place, the same does the number of individual lexemes adjusted for total word count. Text E is contrary to expectations not in the top, but rather in the lower middle on both tests.

Text N and text R are the only texts that are evaluated differently in the two tests. This could be because text N's score in the seven-letters-or-more test is skewed by a high number of task-related compound lexemes. This gives a disproportionate high number of long lexemes compared to the total number of lexemes in the text. Text R has a similar total number of lexemes in the text as text N and E, but it is a bit shorter, meaning that it has a higher amount of different lexemes compared to length. It thus scores better in the second test.

Lexical diversity as scored by the number of words with 7 letters or more puts the two English L1 texts in the bottom, with the Norwegian L1 user in fourth place.

Text	7 letters	7 Lex/tot	Text	Of total number of words	Text	Lexemes in text
M	106/79	0,21	M	184/383 = 0,48	M	184
I	79/62	0,22	I	135/286 = 0,47	E	154
N	75/57	0,16	R	150/348 = 0,43	R	150
E	72/49	0,13	E	154/371 = 0,42	N	149
R	67/49	0,14	N	149/363 = 0,41	I	135
A	68/42	0,12	A	133/344 = 0,39	A	133

4.4 Consonantal clusters

There is great variation between the texts in the number of lexemes containing a consonantal cluster of three or more consonants, with text M and I having about twice as many lexemes with consonantal clusters as the text with the fewest. Four of the texts have between 17 and 19 lexemes, three of them with around 30 occurrences in total. Text A has some task related vocabulary that is frequently used, resulting in 46 occurrences of its 18 lexemes. Contrary to expectations text E has the lowest number of lexemes containing complex consonantal clusters, if not the lowest number of occurrences.

If looking at the ration of lexemes containing large consonantal clusters to the total number of lexemes there is not much significant change, text I and M are still clearly in the top, while text A, N and R are in the middle, with text E is still clearly in the bottom. Text I has the most lexemes containing a complex consonantal cluster compared to the total number of lexemes and rise to first place. Text A rises from fifth to third place, but is still comparably close to text N and R.

Over-all the texts display very few mistakes in large consonantal clusters, and contrary to expectations there are many more registered in small consonantal clusters of two consonants. Text A contains no spelling mistakes in regard to consonantal clusters of any sizes. For those texts that contain mistakes it is for the most part an epenthesis vowel, reduction by dropping one of the consonants or the construction of a consonantal cluster by adding or not reducing consonants. Most of the mistakes happen within words or across syllable boundaries.

Three of the texts, N, M and E, split up clusters with an epenthesis vowel. Text E has the most examples, in words like **ulovelig*, **foreldere*, **retning*. In the case of N and M the mistakes could be due to overgeneralization of compound rules and will be dealt with in 4.9 below.

In text E, I and R there are a few examples of a consonant being dropped, thus simplifying a consonantal cluster. In text E there is **våken* (*voksen* - adult), text I has **navet* (*navnet* - the name) and **vudere* (*vurdere* – evaluate) and in text R there is **viste* (*visste* – knew). **viste* is only wrong because this word does not have consonantal reduction to separate *visste* and *viste*, and avoiding homographs.

Besides cases of double consonants and vowel length, which will be dealt with in 4.7 below, there are two examples of a consonant being added to create a cluster. In text I **følter seg* (*føler seg* – feels) could be an over-generalization of the preteritum form *følte seg*. The

spelling in text N, **perminsjonen* (*permisjonen* – the leave of absence), could potentially be a simple mistake, as it is the only example, and in all compounds it is spelled correctly.

	Text	Occurrences of CCC-words	CCC-lexemes	CCC-lexemes/total lexemes	comments
1	M	63	36	2 0,196	task related vocabulary
2	I	40	30	1 0,222	
3	N	29	19	4 0,128	
4	R	27	19	5 0,127	
5	A	46	18	3 0,135	task related vocabulary
6	E	30	17	6 0,110	

4.4.1 [ʃ]

The spelling of [ʃ] was hypothesized to be particularly difficult for this group of writers, but contrary to expectations there were no misrepresentations of this phoneme in four of the texts. Text E contains the misspelling *concentrasjonen* for the word *konsentrasjonen* (the concentration). This spelling appears to be highly affected by the English equivalent and the spelling *-si* seems to be a mix of the respective spellings in each language. It is possible that there is letter substitution, particularly because *i* and *j* are quite similar letters.

In text I there are two examples of a [ʃ]-spelling for a [ç]-sound; **skjønnel* and **skjønn* for *kjønn* /çøn/ (gender). It is possible that *kjønn* has been confused with the word *skjønn* (judgement/beautiful). The words are minimal pairs, but in addition to [ç] being a rare phoneme, the distinction is collapsing in many areas of Norway. This would make the words hard to distinguish.

The grapheme *-rs-* which produces [ʃ] through assimilation is very common in all texts, possibly due to <norsk> being a frequent adjective.

	Text	Occurrences	lexemes	graphemes	Misspelled words	comments
1	M	28	14	5	-	Task-related vocabulary: <i>norsk</i> (17)
2	I	18	12	5	<i>*skjønn</i> <i>*skjønnel</i>	
3	A	12	8	4	-	Task-related vocabulary: <i>norsk</i> (4)
4	N	14	7	4	-	Task-related vocabulary: <i>permisjon</i> (8)
5	R	6	6	3	-	Loan word <i>perservere</i>
6	E	5	5	4	<i>*concentrasjonen</i>	Loan-word <i>*moon shine</i>

4.4.2 Assimilation

There is great variation between the texts as to how many words that contain assimilation there are in them, from 11 to 36 words and 6 to 14 lexemes. Three of the texts, text A, E and I,

have one lexeme related to the prompt that accounts for more than half of the occurrences of words with retroflex sounds. If this lexeme is removed from the wordcount the results are much more even, with 9 – 17 words and 5 to 13 lexemes. Text E displays the least variation in the lexemes and also has the fewest occurrences if the lexeme “barn” is disregarded.

Text I is the only text with examples of consonant reduction in graphemes representing retroflexes, namely in **vudere* and **vuderer* (evaluate) and in **pøsonlige* (*personlige* - personal). In all three cases it is the *r* that has been dropped. It is possible that these spellings are a form of phonologic spelling, but that the speller does not hear the assimilation. This seems to be the case for the spelling of the lexeme *vudere*, as it is not found correctly spelled. *Personlig* is however found correctly spelled twice in the text.

Text	Words	lexemes	Lexemes of total lexemes in text	Text	Minus task-related vocabulary	Task-related vocabulary
M	36	14	2 0,076	M	17/13	Norsk (19)
R	16	13	1 0,086	R	15/13	
A	36	10	3 0,075	N	16/10	
N	16	10	4 0,067	A	14/9	barn (22)
I	11	8	5 0,059	I	11/8	
E	21	6	6 0,039	E	9/5	barn (12)

4.5 Vowels

All texts display some difficulties with vowels, but there is a broad variation in the types of mistakes, from apocope and over-generalisation of rules to what appears to be difficulty with the three Norwegian letters. Text E is without a doubt the text with the most mistakes, partly because of constantly violating og/å-rules by always selecting *og*. *Å* is selected correctly only once, while *og* is mistakenly selected 17 times where *å* would have been correct. Difficulty in keeping these homophones separate is common during literacy training in Norwegian.

Examples of apocope, the disappearance of an unstressed syllable or –e’, are found in text A and R, three instances in each. All examples are either from verbs or adjectives. It is possible that the adjectives reflect difficulty with the definite/indefinite distinction of adjectival inflection. The spelling of the verbs might be due to influence from spoken language as apocope is prevalent in many dialects. Other spellings that are not phonetically viable, but could reflect L2 speaker pronunciation or dialect variations are

Text I **pøsonlig* (*personlig* – personally)

Text N **valdig* (*veldig* – very) **gammal* (**gammel* – old)

There are also spellings that are phonetically viable from an L1 perspective, but not correct.

Some examples are showed below:

Text E **låv* (*lov* - law) **di* (*de* – them) **hvere* (*være* – be)

Text M **unjon* (*union* – union)

Text R **son* (*sånn* – like this)

Confusion between *di* (feminine 2nd person possessive pronoun) and *de* (3rd person plural pronoun) is common in Norwegian literacy training, as the words are homophones. The spelling of **hvere* is phonetically viable because *e* + *r* is pronounced /æ:r/ and *h* is not pronounced in front of *v*.

Two texts have spelling mistakes that could indicate that the Norwegian graphemes *ø* and *å* might be a problem. For text I four of seven mistakes are related to one of these graphemes, for text N there is one of four. Two of the mistakes in text I could be related to handwriting, namely **a fokusere* (*å fokusere* – to focus) and **skjonnell*. (*kjønnel* – the gender). These spelling seem to indicate that the candidate meant to write *å* and *ø*, but that they were not finished. Both words are found with the correct, finished grapheme elsewhere. In the words **vitenskåp* and **pøsonlig* the graphemes are used instead of other, perhaps more familiar graphemes, perhaps in response to pronunciation.

Even though all texts show some difficulty with vowels, there are quite few considering Norwegian’s many vowel phonemes. Avoidance is a possibility.

text	Mistakes	Comments
A	3	
E	24	17 Og/å-mistakes
I	7	
M	2	
N	4	
R	4	

4.6 Silent letters

Over-all there are very few mistakes concerning silent letters. Text N and text R contained no mistakes and two texts, A and M, contained only one mistake, but the same word or similar grammatical category were correct in the rest of the text. In text A *det* is spelled correctly nine times, and as **de* once. Text M lacks one silent –*t* in singular neuter definite form in the word **yrke*, but not in *språket* and *løpet*. It is possible that this reflects problems with the definite/indefinite category rather than spelling. Both of these words are phonetically viable, as both –*t*’s are silent. Text E has the most mistakes, with four. Two are overgeneralisation of *h* + *v*, **hvere* for *være* and **hvet* for *vet*; two are dropping of silent “d” in *forbudt* and *forbundet*. Text I also drops a silent “g” in *likeverdige* and a silent “d” in *utenlandske*. Moreover the unstressed syllable –*en* is also dropped, giving the form **utlanske*. [*U*]tenlandske is also found correctly spelled.

4.7 Double consonants

L1 Norwegian text has the most CC mistakes, with 28 in total. Reduction of double consonants is by far the most common, with only 13 of 34 words with CC spelled correctly. There are also 7 words in which a CC is faultily added. The rest of the texts contain a low number of mistakes, from 2 to 6, but it does not seem likely that there is avoidance, as all of the texts contain more words spelled with a CC than text E (from 40 to 53 in each text). When text E is excluded, there does not seem to be any overall preferred strategy in the material, as there are 10 reductions and 9 additions of consonants in total. Text M and text R seem to show a preference for reduction, while text I and text N show a preference for adding. Text A has one of each.

Text	Total number of CC mistakes	Correct CC/Words spelled with CC	Consonant omitted	Consonant added
E	28	13/33	21	7
M	6	47/52	5	1
I	6	48/49	1	5
R	3	50/53	3	0
A	2	39/40	1	1
N	2	43/43	0	2

All texts spell all or most of the small, frequent words correctly without a double consonant. Because they are pronounced with a short vowel, spelling these words with a double consonant is orthographically viable, but according to orthographic convention they are not. It does not seem that this type of words is a challenge for most of the participants. Text A, M and R have no mistakes in this group of words, while text E and I has one mistake each and text N has two. Some of the spellings are orthographic representations of a homograph of the intended word: text E has written **skall* (*skal* – shall) and text N **mann* (*man* – impersonal pronoun) and **enn* (*en* – impersonal pronoun). Text I has written **likevell* (*likevel* – none the less), which is a common spelling mistake also in L1 Norwegian.

Only one misspelling is caused by not adhering to the reduction rules of Norwegian. Text I contains the word “*spesiellt”. Text R has the word “*viste”, which should be spelled “visste”. This spelling is an exception of the reduction rules.

4.8 Punctuation and capitalization

Most of the texts present some difficulty in this category, except text A, which contains no punctuation or capitalization mistakes. Over all the placement of commas seems to be the most difficult to master. Adding superfluous commas is the most common error, often in connection with fronting of an adverbial or similar. This could be over-generalization as sub-clauses that are fronted must be followed by a comma. Text A avoids fronting and complex sentence structures, thus minimizing the risk of misusing commas. Text E is missing nine commas, and given the length of the sentences there is a possibility that the text is also missing some full stops.

Only two of the texts contain capitalization mistakes. Text I contains some capital letters in the middle of sentences and some lower case letters at the start of sentences. Two of these are what appears to be capitalization of *f*'s in the middle of sentences, and could be due to handwriting. Text I also has some other difficulties with handwriting, as there is frequently no visible crossing of t's, no circle above "å" et cetera. Text R have one lower case letter at the start of a sentence, and has capital letters at the start of **Amerikanske* and **Kommunistiske*. This is possible transfer of capitalisation rules from the L1, English.

Text	Total number of mistakes	Missing commas	Superfluous commas	Capitalization mistakes
A	0	0	0	0
I	5	1	0	4
N	5	0	5	0
R	8	2	3	3
E	9	9	0	0
M	11	2	9	0

4.9 Compound words

Contrary to expectations not all texts display difficulty with compound words. Text N and text A have no mistakenly separated compound words. For text A there is possible avoidance or underproduction, as there is less than half the number of lexemes as the text with the second fewest compound words. With 13 in total in the text, the number of occurrences is comparable to some of the other texts, even though it is still the lowest over all. Text M and I have the most lexemes and occurrences, with 25 lexemes each and 34 and 33 occurrences respectively. This could partly be task related, but it could also be that the L1-background has made them less inclined to avoid longer words and compounds. Text R has split 5 compounds of 20 in the text, while text E has split 5 of the 15 in the text, giving both of them a fairly high failure-rate.

Text	Total number of occurrences	Lexemes	Split compounds
M	34	25	1
I	33	25	2
N	29	16	0
R	20	14	5
E	15	14	5 (4 lexemes)
A	13	7	0

In the six text there is a total of three examples of words that are written in together that should not be. One possibility is that they are simple mistakes, and that the writers simply have forgotten or by accident have deleted a whitespace. This cannot be ruled out for text E's **forvanskelig* and text N's **krevefedrekvoten*, as they are written on a word document, and indeed seems likely for **krevefedrekvoten*, as it is similar to no word and would leave the sentence without a main verb. Text M's noun **norskspråk* and text E's **forvanskelig* are both similar to existing Norwegian words, namely to the adjective *norskspråklig* and the verb *å forvanske*, and the spelling could be constructed analogically to them.

The texts show few problems with selecting an appropriate infix if necessary. Text M have two words, **norskeferdigheter* and **flerekulturell*, in which the infix –e is mistakenly selected. In text N also there is the word *fødselsepermisjon* in which the infix –e is again chosen for all five occurrences in the text. This might be done to break up consonantal clusters as previously mentioned, but in the case of **flerekulturell* it might be due to the writer not being aware that “flere” in compound words is reduced to “fler-“. **norskeferdigheter* is also the only compound word with “norsk-“ as the antecedent where this mistake is done, both *norskprøve* and *norskkurs* is written correctly the six times they occur, and both with an equally or more complex consonantal cluster. This seems to indicate that **norskeferdigheter* is a simple mistake.

In only three of the texts there are examples of unstable spelling of compound words. Text M has as mentioned in the previous paragraph **norskeferdigheter*, but *norskprøve* and *norskkurs*, Text R has **pris kontroller* and *priskontroll*, with two occurrences of each and text E has **helse skader*, but also *helsedirektoratet* and *helse- og omsorgskomiteen*. It is highly likely that the two later words are found in the task prompt.

4.10 Syntactical variation

Text	Non-subject fronted	Non-subject fronted of possible	finite verb-placement	Sentence adverbial-placement	Occurrences of sentence adverbials	Sentence adverbials in sub-clauses
A	4	0,17	0	0	15	5
E	6	0,35	0	0	8	4
I	5	0,29	0	1*	9	3
M	14	0,58	0	1	6	2
N	9	0,5	2	1	7	3
R	8	0,32	0	0	12	4

*The error fits both categories, as it is placing a sentence adverbial before the finite verb

Contrary to what might be expected the V2-phenomenon and the placement of sentence adverbials appears not to be a significant problem for these L2-learners of Norwegian. There is thus little sign of transfer in syntax. Not wholly surprisingly text E displays no syntax errors, but somewhat more surprisingly neither does text A and R. As text A was written by hand there is evidence that it was not always a simple decision, as there are instances of crossing out and moving verbs and sentence adverbials. For finite verb placement there might be some avoidance in text A, as it has by far the lowest number of non-subject fronting, with only four occurrences of 24 possible, thus minimalizing the amount of verb movement and inversion. This does not seem to be the case for the placement of sentence adverbials in sub-clauses, as 1/3 of all sentence adverbials are found in sub-clauses. There also an instance of two sentence adverbials in the same clause:

*Hvis foreldrene *synnes at de må være strengere, bør de kanskje først se [...]*
 If the-parents think that they must be stricter, should they perhaps first look [...]

The placement of sentence adverbials in a sentence containing two is what caused text M's only error. One was placed correctly after the verb, but one was erroneously placed between the subject and the verb.

With three, text N has the most syntax mistakes, and the only one that has misplaced a finite verb. This has happened both after the fronting of a sub-clause, but also after a two-word adverbial.

4.11 Structure and content

The inter-rater stability was very low. This can stem from a difference in the knowledge about the task formulations and the extra information. This could be different if they had both had equal access and knowledge of the tasks.

Independent rater 1 commented that the structure was bad in all of them and damaged the texts ability to communicate. She rated the content in most texts to be better or equal to the texts communication, except for text N. The texts generally had a good introduction, but all of them had a poor ending or completely lacking an ending. This can perhaps be caused by fatigue or simply running out of time to work on the ending. The content was overall good/acceptable. She did not pay that much attention to spelling. She also commented that the spelling errors could be due to lack of training (this was said before she was made aware of the nature of the study). She was surprised when told that all of them had dyslexia, as the spelling was quite good in many of them. She expressed a need for seeing the tasks, but they were sadly not available. Some of her judgements might be affected by this, as she suspected some of them to have copy-pasted parts of the prompts. This copy-pasting might have affected their structuring of text as this is hard to structure.

Independent rater 2 found most texts to be unsatisfactory. He also did not focus on spelling, but more on the over-all communication of the text. He commented that many of the mistakes in the text could have other sources than dyslexia, but that text E was a clear candidate for a diagnosis, also before he was made aware of the nature of the study. He commented that the spelling was good in many of them, at least not typical of his experience with dyslexia.

Rater 2 has a thorough knowledge of Test in Norwegian – Advanced Level (Bergenstesten), and recognized some of the tasks/prompts that had been given. He therefore saw some copy-pasting, which rater 1 could not have seen. This might have affected his evaluation. This can also have given a skewed rating from him, as he might not as easily remember the older prompts.

text	Content	Rater 1	communication	Rater 2	Comments
A	C-		D/E	C	Copy-paste
E	F		F	F	Copy-paste
I	C		D/E	E/F	Copy-paste
M	E/F		E/F	D/E	Unknown task
N	C		C+	E/F	Copy-paste
R	C		D	F	

When the researcher finally got access to the tasks, it was clear that all of the texts for which the tasks were available contained copy-paste. The task for text M was not included and has as of yet not been provided. By copy-paste is meant when a sentence or a large part of a

sentence, such as a clause, has been copied into the submitted text word for word with only minor changes such as omitting a preposition or adding a full stop. Text A is the text that has copy-pasted the most of the extra resources, as close to all of the additional information has been included, but not paraphrased. Much of what was pointed out as particularly strong sentences by rater 1 was copy-pasted. Text E contains less, and only copy-pasted one sentence, successfully paraphrasing another. Text I successfully paraphrased much, but copy-pasted one long sentence, exchanging only one word. Text N copy-pasted a sentence that was pointed out as good, due to much good and precise vocabulary. There was also an attempt at paraphrasing, but the altered sentence is not syntactically correct and does not communicate well. Text R was suspected of copy-pasting by independent rater 2, but even though all the extra information is included in the presentation, it does not follow the original to such an extent that it can be deemed copy-pasting. As both syntax and words are changed, this is successful paraphrasing.

5 Discussion

In the last chapter the results of the analyses were presented. The sample studied here is too small and too diverse for any significant results, but this chapter aims to point out any tendencies that might be worthwhile to pursue and to see if any part of the research questions can be answered.

- What characterises texts written by adult L2-learners of Norwegian with dyslexia?
- Is there any of these characteristics that cannot be attributed to anything but dyslexia?
- Are these characteristics the same as what characterizes texts written by Norwegian L1 individuals with dyslexia?

5.1 Characteristics of the analysed L2-texts

It is clear that the texts are as influenced by being written by L2-users of Norwegian as being written by individuals with dyslexia. Most of the texts show patterns that might stem from cross-linguistic influence.

Text M shows possible cross-linguistic influence from the L1, as the text contains the most or second most occurrences of all the types of consonantal clusters. Consonantal clusters are prevalent in Polish and can become even more complex than in Norwegian. Polish can have up to four consonants in both onset and coda, whereas Norwegian can have three in onset and four in coda. Being able to have four consonants in coda presupposes that having three consonants in coda is possible, and is therefore a marked structure in comparison. Polish is the only language included in this thesis that has a more complex syllable structure than Norwegian, and as going from a less marked structure to an unmarked structure is supposed to be easier than the opposite, this result seems to agree with the theory. This text was also the text that had the most difficulty with determinants, omitting nine and adding two. This is probably cross-linguistic influence from the L1, as Polish does not have determinants.

Text I, German, similarly to text M, does not show much difficulty with complex consonantal clusters, which could be similar cross linguistic influence, but the text does show avoidance of words containing assimilation compared to the other texts and the number of other consonantal clusters. This seems to indicate that it is not consonantal clusters that are the problem, but the retroflex phonemes and their graphemes. As all included languages lack retroflexes one would expect all texts to show a similar tendency, yet text I is the only text that does. It can be that the writer of text I has transferred a more orthophone spelling strategy from the shallower German orthography, and that these types of spelling errors reveal

difficulty perceiving this phonetic category. This can possibly stem from dyslexia and will be discussed below.

Text N also show a tendency towards orthophone spelling, with several orthographically viable spellings that are wrong only because they disregard higher order spelling rules. This can be due to transferring spelling strategies from the L1, Italian, but this type of error is also typical of errors found in L1 Italian dyslexia. With the simple syllable structure of Italian one could expect the transition to Norwegian syllable structure to give rise to avoidance or difficulties. This seems not to be the case. It is possible that this stems cross-linguistic influence from an earlier L2 with a more complex syllable structure, perhaps English, but this is mere speculation from the researcher's side, as no information is available on the language background of the participants besides L1.

5.2 Characteristics compared to those found in Norwegian L1 texts written in dyslexia

These texts are written under circumstances that should elicit traces of dyslexia. The constraints on memory found in dyslexia should result in a reduction in the ability to cope with the same level of demand on writing process that the non-dyslexic participants handle when producing text. The genre is argumentative essay, which should pose a high cognitive demand. Test in Norwegian – advanced level will also be a high stakes situation for many of the candidates, as their work or study plans might hinge on them passing this test. They might therefore be under a great deal of pressure to succeed. The analysed texts are also from the last part of the test, increasing the likelihood of tiredness and mental exhaustion. There is also the risk of the participants having prioritized their time poorly, resulting in them having less time than they should for writing and editing the argumentative essay. All together this task is complex enough to challenge even these probably highly compensated adults, and the signs of dyslexia should be apparent in all of the texts, particularly in lower order skills such as spelling.

Spelling is found to be a persisting problem in L1 performance with dyslexia in all the included languages, and the expectancy was therefore to find a significant amount of spelling mistakes in all texts. Areas found to be typically challenging in Norwegian L1 dyslexia were looked into. The results show that compound words, single and double consonants, and even the complex syllable structure of Norwegian do not seem to present great difficulty for most of the L2-texts, even if there are errors and signs of avoidance. There are some spelling errors

which might be the result of a phonetic spelling strategy, but they are affected by the writer's L2 status of Norwegian, thus making them different from how an L1 Norwegian with dyslexia would choose to write the word. It does, however, seem likely that spellings such as **hølge*, **uvelig* and **vudere* could be spellings that represent how the writer would pronounce the word. Punctuation is the one area where there are problems or avoidance for most texts. This is reported to be a problem characterizing writing in dyslexia for most of the languages.

Over-all it therefore seems that these texts do only to some degree conform to what is typically thought of as characteristic signs of dyslexia in written texts in Norwegian L1, and at the same time the amount of errors were low, and perhaps not more than what is expected considering that these texts are written in an L2. As there is no control group without dyslexia, it is possible that the inclusion of one would have revealed even less spelling errors in that group, and that comparatively there would have been more in the group with dyslexia. A possible reason for this lack of difficulties presented in spelling might be the age of the participants. The descriptions of dyslexia in Norwegian L1 written texts have all been based on children and adolescents, and even though spelling is consistently found to be a problem for adult with dyslexia, some compensatory strategies might evolve with age and education.

In addition to the generally low level of errors in the L2 dyslexia group, there is another finding that is slightly problematic, namely the poor performance of text E. As Norwegian is stated to be L1, one could expect the text to present less difficulty than the others, as writing in an L1 should be a less cognitively demanding task, in addition to being something the participant had more exposure and training in than the others, even with education from abroad. Instead the L1-speaker of Norwegian was found to score generally in the lower or medium on most measures compared to the other texts, and was deemed the worst by both raters. Text E contains all the typical signs of dyslexia in written L1 Norwegian mentioned in 2.6.1.3, such as difficulty with double consonants, split compound words, incomplete punctuation and phonological spelling of oblique words. The lack of relevant arguments and poor structure pointed out by both raters could indicate that this includes little training in writing an argumentative essay. In addition to this the language in the text is very oral, and could point toward that this participant has had little written literacy training in Norwegian.

There are several possible explanations for these results. The first is that the self-identified L1-user of Norwegian in reality is an unbalanced bilingual, perhaps with less input in Norwegian in addition to less formal literacy training in Norwegian. The second is that this individual has a more severe degree of dyslexia than the others. The sample is small, so this is

not implausible. It seems likely that there is a selection bias in this thesis, as there is the possibility that people with a milder degree of dyslexia are more likely to immigrate to a new country with a new language. It might even be possible that those with mild dyslexia are more inclined to consent to research than those with a more severe degree. The result of this possible difference in severity is that even though the other texts are written in an L2, the effects of dyslexia are still stronger in the L1 text, resulting in more visible problems. The third explanation stems from mistakes concerning grammatical categories, such as *og* for *å*, which could indicate SLI. One or a combination of these hypotheses can perhaps be the explanation for this seemingly illogical performance.

5.3 Characteristics that can be caused by dyslexia

Brady, Bishop and Snowling all suggest that the underlying phonological deficit stems from Fuzzy, faulty or impoverished phonological representations (Bishop & Snowling, 2004; Brady, 1997). Because the mappings between phonology and orthography depend on fine-grained connections, the less distinct phonological representations in dyslexia will give rise to difficulty with establishing mappings between phonology and orthography (Bishop & Snowling, 2004). It can also lead to difficulty in picking the correct orthographic representation when phonologically similar alternatives are available. In all of these text there are several examples of word choices and spellings that can be explained based on this.

1. [...] hvorfor barnet *oppholder seg dårlig. Target word: <oppfører>
 [...] why the child *dwells (behaves) poorly (Text A)
2. [...] som *våken har du en *responsabilitet Target word: <voksen>
 [...] as *awake (an adult) have you a responsibility (Text E)
3. Noen arbeidsgiver *følter kanskje at det er el «wildcard» Target word: <føler>
 Some employers *felts (feels) perhaps that it is a “wildcard”(Text I)

In all of these three examples a word phonetically similar to the target word has been wrongfully selected. Semantically there are often little relation between the words, eventhough there are examples such as 3, in which words that are both semantically and phonetically similar are confused. Not all examples are as closely related as *føler* – *følte*, which are conjugations of the same verb. If there had been a control group it is possible that there would have been a marked difference in the number of this type of errors between the groups, with the most errors found in the group with dyslexia.

Certain phonemes are easier to discover than others because of perceptual salience (Brady, 1997, 38). Difficulties with speech perception and phonological awareness are found in dyslexia, and can be the underlying cause for phonetic spellings such as **vudere*. None of the included languages have the Norwegian retroflexes, and these sounds should then be ideal for looking into this area, as they are quite similar to their dental counterparts and thus may not be particularly salient. The only text to show this type of difficulty is however text I, German. It could be that the perceived or real closeness of German and Norwegian is what has come in the way. If two languages are perceived as similar, cross-linguistic transfer is more likely to occur (Abrahamsson, 2009) and it is therefore possible that a speaker with L1 German is more likely to not look for differences than speakers of some of the other languages in this thesis.

There might also be rapid decay of activation, meaning that the acquisition of new vocabulary will take more exposure and longer time (Bishop & Snowling, 2004). This thesis cannot give any indication as to whether or not this is correct, as there is no control group and there is little knowledge as to the onset of acquisition of Norwegian. The Norwegian L1 text is, however, not the most lexically diverse.

Perhaps the most interesting findings are that the results for structure and content seem to indicate that the dyslexia has affected higher-order functions in writing. All texts were scored to C or worse, and many would not have received a passing grade. It does seem possible that the focus given to lower order functions such as spelling and punctuation has been at the expense of the focus on higher order functions, such as organization, planning and reviewing, perhaps due to the constraints on memory found in dyslexia. This is in line with Connelly et al. (2006) results from university students and Lane and Lewandowski's research on written composition among children. Some of the parts rewarded with a higher grade from rater 1 were exposed as copy-pasting from the task information by rater 2 and this was confirmed by the researcher when access to the tasks was granted. This seems to indicate that the over-all content and communication of the text has indeed suffered, too much focus being needed at lower levels.

It does not appear to be an advantage to have the extra information, as it seems hard to incorporate seamlessly, and too many of them have copy-pasted much of it. Even though the ratings of one rater are too little to conclude on, there seems to be a tendency towards not so poor content being communicated poorly. They have the ideas, but presenting these points and ideas by committing them to paper seems to be difficult.

Text A is evaluated to be the best text over-all, if the scores from the raters are compared. At the same time it is the text with the smallest lexical diversity, except for the sentence adverbials, and there are avoidance of complex sentence structures, compound words and possibly other areas as well. It is possible that by using words and structures that are mastered the writer has had more energy for higher-order functions, and less risk for errors. It therefore seems that avoidance of problematic areas is a valuable strategy that can be beneficial in a test like this, even though a large, precise vocabulary and mastery of a wide range of sentence structures were mentioned by both raters as something they rewarded in a text.

6 Methodological considerations and limitations

There are several methodological considerations with this thesis that must be addressed and should be amended if a similar study were to be carried out again. The first consideration is the sample size which is too small. With as few as five texts, all with a varied background, few conclusions can be drawn, especially because this thesis is in the intersection of several relatively unexplored scientific areas, namely Norwegian as a Second Language, dyslexia's effect on written texts, dyslexia in an adult population and dyslexia's effect on the acquisition of a second language. Due to a variety of reasons and limited time there is also no control group. The control group should consist of individuals with the same language background but sans the dyslexia to be more certain the findings are actually from dyslexia and not the participants L2 background. Educational background should also be taken into account, as a transfer of skills and strategies are possible. All results are therefore preliminary and must be taken as a pointer to possible areas of interest for further, more robust research.

As all participants were recruited from candidates that had received an adapted test procedure, meaning that they all had had to present a dyslexia diagnosis. At what age and on which basis this diagnosis was given is unknown to the researcher, as are the specific criteria used. As these participants have not been tested in any way, possible misdiagnosis cannot be ruled out. The severity of the participants' dyslexia and their compensatory strategies are also not known to the researcher, and might vary significantly.

There is also much information on language background that could significantly affect the conclusions of this thesis. Time of residency in Norway and where in Norway the participants have lived would have an effect on amount of input and type of input the participants have received, as would information on how they have acquired Norwegian and when and with what frequency they use it. Some might not have had much literacy training; others might have a Norwegian spouse, or have work that requires the daily use of English. As L2's are also shown to have an effect on the acquisition of further L2's, this could also be information of interest to this thesis.

7 Conclusion

With the methodological considerations in mind there are still some interesting tendencies, even if it is uncertain whether or not it can be generalized outside of this sample. The studied texts does not all conform to the typical picture of dyslexia in L1 Norwegian written texts. Most interesting is perhaps the finding that the spelling is over all good in most texts and almost perfect in one, particularly considering the dual status of the texts being written by L2-users and individuals with dyslexia. It is also quite apparent that it is difficult to distinguish which traits and tendencies are due to dyslexia and which are due to the L2 status.

Some signs of fuzzy representations were found, and they are in accordance with the reigning theory in the area. It would have been interesting to see whether there would be found the same type of errors in a non-dyslexic control group.

Test of Norwegian – advanced level (Bergenstesten) allows for one adaptation of the test where a dyslexia diagnosis is taken into account by the censor. This thesis show how complicated this might be to do fairly and consistently, as the variation between the texts were substantial. In well compensated adults there might not be any of the “typical” traits of dyslexia, i.e. difficulties in spelling, but more subtle effects, such as a smaller vocabulary, less syntactical variation and a general problem with structuring or just a higher frequency of the mistakes commonly found in texts written in L2 Norwegian. The texts analysed in this thesis all present difficulty in structuring of the content, suggesting that this might be one of the most problematic areas. Structuring and presentation of content is at the heart of writing an argumentative essay and will therefore be impossible to disregard in an evaluation, even if the problem might stem from dyslexia. While this thesis cannot contribute any hard-hitting results, it is clear that this is an area in need of further research.

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