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Accent proficiency in second language English

Relationships with general language proficiency and bilingual profile.

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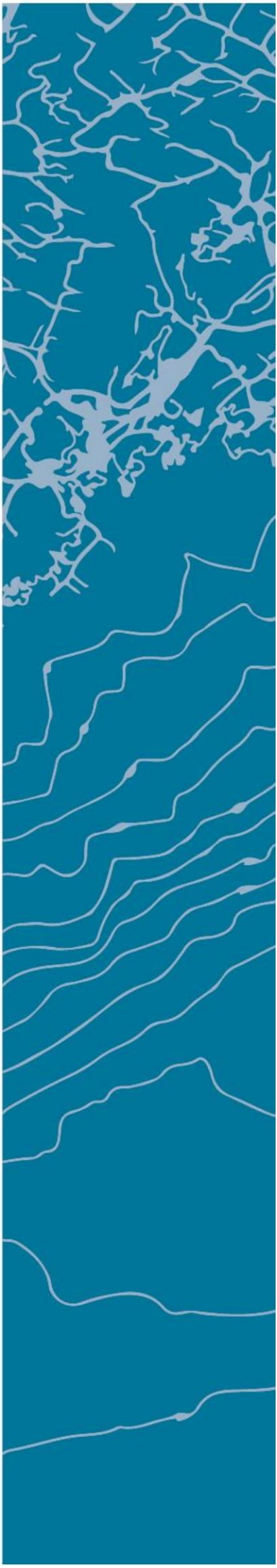

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Acknowledgements

Well, it's been a long and winding road…

First of all, thank you to Linda Wheeldon and Allison Wetterlin for getting me involved in this project, and for your undying enthusiasm and optimism. Working on an experimental project can have its challenges for someone who likes things to be orderly and structured, but we made it!

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Introduction and general structure.

Most people in the world speak more than one language, and in recent years research on bilingualism has mainly focused on the effects of bilingualism on language processing (e.g., Smith, 1997; Grosjean, 1998, 2001; De Groot, Delmaar & Lupker 2000; Dijkstra & Van Heuven 2002). Research in this field is complex because not all bilinguals are the same. They can differ in a myriad of ways and many of these differences relate to aspects of their language performance. For example, the age a second language is acquired has been shown to affect the speaker's degree of both native accent (Flege, 1987; Flege, Yeni-Komshian & Liu 1999; Moyer, 1999, 2004), and proficiency (Patkowski, 1990; Bialystok & Hakuta, 1999; De Keyser, 2000). In particular, second language proficiency has been shown to be an important variable in determining many aspects of bilingual performance (e.g. Cummins, 1980; Van Gelderen et al., 2004; Hulstijn, Van Gelderen & Schoonen, 2009).

Several studies rely on simple self-rated proficiency measures, which have been shown to correlate significantly with objective measures of L2 (second language) skill (Chincotta & Underwood, 1998; Flege et al., 1999, 2002; Jia et al., 2002; Marian et al., 2007). However, bilinguals can also differ in their proficiency in different levels of linguistic skill. It is not uncommon for some L2 speakers to have extensive vocabularies but limited morphosyntactic proficiency, or similarly, to be very proficient in reading comprehension and writing, but a less proficient speaker in terms of pronunciation. Interestingly, very little work has investigated the relationship between accent proficiency and other levels of L2 language proficiency. This is surprising, as a near-native L2 accent is assumed to be an important- and the most noticeable- marker of L2 proficiency (Moyer, 2007; see review in Munro & Derwing, 1995). This study aims to examine this overlooked area, and adds to existing research in the following ways:

- We asked bilinguals to rate their L2 language proficiency on a more detailed set of scales relating to different levels of linguistic skill, i.e. speaking, understanding, reading, writing, grammar, vocabulary, spelling and pronunciation. In particular we collected novel data relevant to accent proficiency and attitudes towards accent in both L1 and L2, thereby also including participants' native L1 dialect.
- We collected objective data from our participants on a series of tasks designed to estimate their actual proficiency at different levels of linguistic skill corresponding to the self-rated levels.

Our aims were first to determine how self-rated measures of accent proficiency relate to other measures of language proficiency as well as other aspects of language profile (e.g. age of acquisition, and nature of language learning, exposure and use). We aimed secondly to determine how self-rated proficiency at different levels of linguistic skill relate to actual measures by comparing rated values and test scores. The following section will first discuss general aspects of bilingualism and the key variables used in research on bilingualism, proficiency and age of acquisition. As many studies have taken a single approach to the topic, and the methods used often differ, a more comprehensive overview of previous studies is needed for insight into the field. Then, key models on bilingualism will be discussed in terms of how they relate to the key topics of processing and proficiency, with particular emphasis on accent proficiency. A general review on theories of foreign accent will also be given, along with a description of key differences between Norwegian and English, and the consequent possibility for L1 transfer mistakes. Finally, use of self-rating in bilingual profiling will be discussed, before placing this present study in a context of previous work on the area and outlining the major points for research.

What is bilingualism?

There are many different views on what the term 'bilingual' actually means. While collecting data for this project, we often met the preconception that a bilingual is a person who has grown up speaking two languages, for example due to having two parents with two different first languages. This is, however, not a view that on the whole is shared by linguists and researchers. A simple definition is given by Roelofs, "Bilingual speakers are persons who regularly use two or more languages for their verbal communication" (2003: 175). By this definition, a large portion of the general public are in fact bilinguals, just by having some degree of knowledge of two or more languages, and being able to use them in communication with some regularity. Roelofs does not, however, set any criteria for the degree of knowledge required to fit this definition. Using a language for communication does not say much about how advanced, or indeed successful, this communication needs to be. Roelofs does, on the other hand, mention that as most bilinguals use their languages for different purposes and in different situations, perfectly balanced speakers with equal fluency and command of both languages in all situations are "probably the exception" (2003:176).

Further exploring this issue are Luk and Bialystok (2013), who claim that bilingualism cannot be seen as a categorical variable; the criteria for determining whether an individual is mono- or bilingual are at best fuzzy, and they mention that several studies have featured 'monolinguals' who actually report knowing more than one language. Luk and Bialystok call for designation criteria that involve "an

interaction of language proficiency and usage" (2013: 605). It should be obvious that knowing a few words in a second language is hardly sufficient to allow actual communication, as featured in Roelof's definition, and for that reason, some measures of proficiency need to be taken into account. That again leads us to the question of how to define and quantify linguistic proficiency. That question will be discussed later on in this section.

Nonetheless, a distinction that can be made regardless of any proficiency measures, relates to age of acquisition (AoA) of the L2. Most studies on bilingualism have considered AoA as an important research factor, often in terms of debating the existence of a critical period in L2 acquisition (see Birdsong, 1999 for review). The terms 'early' and 'late' bilinguals are used, where early bilingualism is usually considered as learners who have acquired their L2 before the onset of puberty. An important reason why AoA is considered important in bilingualism research, is due to the fact that physiological changes in the brain that occur with age are seen as important to language acquisition (reviewed by Abutalebi et al., 2005). Cortical plasticity is seen as an important factor in language acquisition, and in terms of performance in most areas of linguistic ability. Both psycho- and neurolinguists have studied first language acquisition, functionality and loss extensively, and their methods of research have also been used increasingly in L2 research. Functional imaging has been used in order to measure actual brain activity, and researchers have compared this activity in terms of L1 and L2 language use and processing. An early research project by Perani et al. (1996) on Italian-English bilinguals showed different patterns in brain activity while listening to stories in L1 and L2 respectively. A large network of areas of the left hemisphere, including perisylvian regions and temporal poles were active as participants listened to stories in their L1, whereas the L2 stories resulted in activation in a more reduced network in the superior and middle temporal gyri. Observations of different patterns in activity led to the conclusion that different brain networks were involved in L1 and L2 acquisition. A subsequent study by Perani et al. (1998), compared research on both late and early bilinguals with a study by Kim et al. (1997), which had found L1 and L2 represented in separate areas of left inferior frontal cortex in late bilinguals, but not in early bilinguals. This area, (Broca's area) is usually associated with language production, whereas Wernicke's area, associated with language processing, showed overlapping patterns of activation in both early and late bilinguals. Perani et al. (1998), however, claimed that these differences of brain activation patterns may to a greater extent be a result of different degrees of proficiency, rather than AoA. As proficiency increases, learners may to a greater extent use the same cortical networks to deal with both L1 and L2, but when participants' proficiency was kept at a constant level, Perani et al. (1998) did not find evidence that that AoA had an impact on L2 brain representations. A functional imaging study by Chee, Tan et al. (1999) considering cued word generation in both L1 and L2 on

highly proficient bilinguals with varying AoA, and showed similar patterns of brain activations for both early and late bilinguals. Nonetheless, although the general body of psycho- and neurolinguistics research on bilingualism has shown that a bilingual brain is different than a monolingual brain, age may not be the determining factor. A PET study by Klein et al. (1995) in which 12 highly proficient bilinguals were tested on phonological and semantic word generation in L1 and L2 gave no evidence that a language learned later is differently represented in the brain than one acquired earlier. Indeed, as shown in multiple PET and fMRI studies (Yetkin et al., 1996; Perani et al., 2003; Briellman et al., 2004), some differences in brain activity between L1 and L2 can be observed, but are not necessarily related to AoA, but rather to *proficiency.* However, as Abutalebi et al. point out, "the neuroimaging data do not question the claim that age of acquisition is a major determinant of proficiency in L2. Many linguistic and neurophysiological studies have found that late learners are typically less proficient than early learners" (2005: 512). Their view is that judging from existing research, brain activity is the result of the interplay between age of acquisition, exposure and proficiency - these three factors are major influences on L2 versus L1 cognitive representation. In summary, although functional imaging has shown different patterns of brain activity in mono- and bilinguals, the nature of these patterns are still unclear, and many have linked them to differences in age of acquisition and proficiency.

Proficiency and language ability

As mentioned above, research divides bilinguals into early and late bilinguals, and one assumes that the plasticity of the brain in younger learners facilitates language acquisition. This in turn entails that learning at different ages or in different situations will have an effect on learning outcome. This makes it relevant to look at learners not just in terms of AoA but also acquired proficiency. This factor is still overlooked in some models of bilingualism, but is covered by some, more developmentally based models.

The concept of language proficiency is difficult to define, and attempts to do so have been approached differently by a number of researchers. Hulstijn (2011) has defined two types of language ability, for both native speakers and nonnative speakers. His distinction for native speakers is divided into the categories *basic language cognition* (BLC) and *higher language cognition* (HLC). Hulstijn gives a tripart definition of what BLC entails - firstly the knowledge of phonetics, prosody, phonology, morphology and syntax that is implicit and unconscious knowledge to adult speakers. Secondly, the same implicit and unconscious lexical knowledge of form-meaning mappings. These two then combine with the third factor, automaticity of processing of these types of knowledge. BLC

is restricted to high frequency items and constructions that L1 speakers use in communication, regardless of age, literacy and educational level, and is therefore restricted to processing and production of speech. Thereby, BLC is seen as a foundation of linguistic ability without any ratings of proficiency, found in all adult native speakers without visual, auditory or mental impairments. HLC, however, extends from BLC in that it entails the processing and production of low-frequency items and constructions in the abovementioned areas of knowledge, and also involves written language. Hulstijn claims that individual differences in reading, writing, listening and speaking will be found in HLC, whereas virtually all adult L1 speakers will "perform at ceiling in BLC tasks" (2011: 232). Differences in HLC performance are then attributed to "cognitive abilities in nonverbal domains (e.g. executive control, reasoning and problem-solving abilities, working-memory capacity) in combination with environmental factors, such as exposure to oral and written language at home, in school or elsewhere" (2011: 234). Thereby, we see that Hulstijn attributes individual differences in L1 linguistic ability to both cognitive ability but also stimulus factors such as education, workplace and home situation. This is then related to proficiency in nonnative (L2) speakers by using the same terms, BLC and HLC. In this context, however, Hulstijn proposes that it is unclear whether post-puberty L2 learners can actually achieve BLC in their second language. Whereas an L2 learner can achieve the same HLC level as a native speaker with the same intellectual ability and similar background, education, etc., there will still be deficiencies in their BLC command. For this reason, Hulstijn questions the idea of the "native" or even "near native L2 speaker", as it is precisely in the BLC the native language proficiency lies. Drawing from this notion, one might compare how bilingual proficiency fits into a theoretical framework of developmental models.

Models of bilingualism

Creating models of bilingualism is dependent on how several factors are viewed. First of all, levels of representation must be considered. A concept will have different linguistic representations, including orthographic, phonological, syntactic and semantic representations. Dependent on the L1 or L2 there might be any degree of overlap between representations in each language, as some languages share greater similarities in script, sound structures and grammatical framework than others. There is considerable evidence that any input of one concept will activate similar, neighbouring concepts related on the level of input (reviewed by Kroll and Tokowicz, 2001). This poses the question of whether a concept will activate representations in simply one language, or whether representations in both languages are activated in parallel. Secondly, looking on from the actual representations, what are the processes involved in selection? Depending on the stance on shared or separate representations, a number of cognitive processes must then recognize and process the input in one

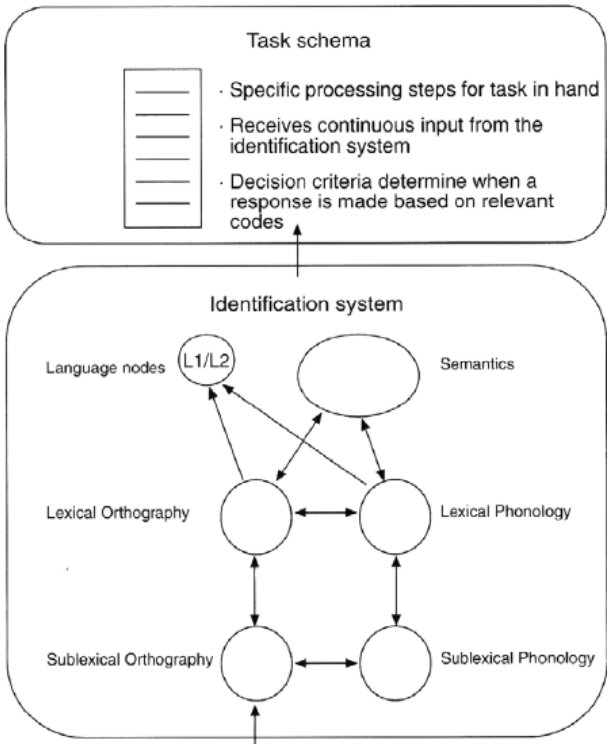
language or the other. The second question is then whether these processes are selective processes used for shared representations, or nonselective processes for separate representations. These questions are also fundamental to the types of models created. Thirdly, models of bilingual processing differ in their focus and what cognitive processes they attempt to explain. Models may focus on either processing (e.g. BIA/BIA+, Dijkstra et al., 1998; Distributed Feature Model, Van Hell & De Groot, 1998) or production (e.g. Poulisse & Bongaerts, 1994; Hermans, 2000), and be based on a number of specific tasks. The following section will attempt to explain key models in terms of both what they set out to explain and the evidence supporting their claims.

The Bilingual Interactive Activation Model

The BIA model focuses primarily on bilingual word recognition. It was proposed by Dijkstra et al. (1998) but is based on a theoretical framework first proposed by McClelland and Rumelhart in 1981. The model was then revised as BIA+ by Dijkstra et al. (2002), the revised version will be described below. The fundamental assumption of the BIA+ model is the existence of an integrated lexicon with representations of both of a bilingual's languages. When a string of letters is visually presented, viable lexical candidates in both languages are activated, and then compete for selection. As one candidate is selected, the rest are suppressed. As shown in figure 1, the model has several levels, and as information feeds from one level to another, word candidates and features will, through a process of inhibition or blocking, eliminate candidates as more information becomes available. The language nodes will in turn have a top-down inhibitory effect based on the parameter settings of the language in question. The assumption that early selection is nonselective or language blind is supported by an array of research which has shown that cross-language neighbours, i.e words that are orthographically similar, but otherwise unrelated (e.g. English *gate,* Spanish *gato- '*cat') influence word recognition in both languages, (e.g. Grainger & Dijkstra, 1992; Jared & Kroll, 2001). Similarly, Jared and Szucs (2002) and von Studnitz and Green (2002) have both shown that recognition of interlingual homophones, i.e. words sharing form but not meaning across languages (e.g. English *room,* Dutch *room- '*cream') is influenced by the frequency of the word in the non-target language. Also, the recognition of cognates, which are similar in form and identical in meaning across languages in both L1 and L2 (e.g. English *hand,* Norwegian *hand/*hand) is facilitated for bilinguals, but not for monolinguals (Dikjstra et al., 1998; Van Hell & Dijkstra, 2002). This supports the assumption fundamental to the BIA/BIA+ models; bilinguals activate both languages in word recognition, and are influenced by relatedness in form and meaning. Had they been able to effectively switch one language on or off, this effect would not have been seen. The further extension of the BIA model into the BIA+ meant the inclusion of semantic information as a part of the interactive decision process, as

well as a task schema outside the lexical identification system. The task schema does not influence the processes of decision, but determines how incoming information is used. Together with the inclusion of semantics, it brings the model out of the realm of just single word recognition, and provides the possibility of a larger pool of contextual information available in processing. The revision relates to for instance a study by Kroll and Sunderman (2006) which found that form-related interference in a translation equivalent judgement task was dependent on both words being part of the same grammatical class. Meaning-related interference, however, was not dependent on shared grammatical class membership. Kroll and Sunderman argued that the task schema can specify that when two words with similar orthographic form but no overlapping meaning activation is presented, grammatical information is made available. This will help to make a final judgement in cases where there is little actual lexical competition. The two BIA models are general models of identification, and do not make any predictions on effects of proficiency.

Figure 1, The BIA+ Model



From Dijkstra & Van Heuven (2002: 182).

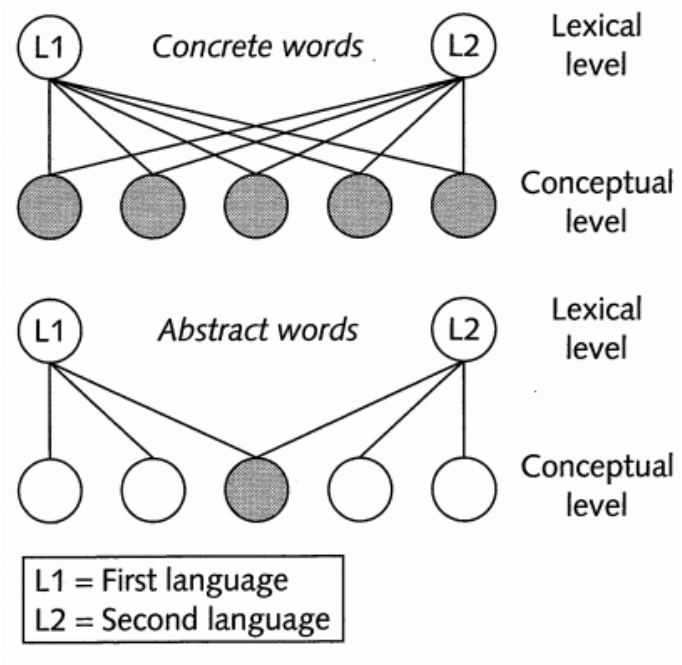
This notion of shared semantic representations across languages is central to the development of several other models. The assumption is based on semantic priming effects seen across languages, for instance in Stroop tasks, where participants are asked to name a picture that has semantic distractor words connected to it. A review by MacLeod (1991) showed how interference is

consistently seen across two languages in tasks where a bilingual sees an L1 colour name written in a different colour ink, and is asked to name the ink colour by its L2 name. This supports an assumption that in reading, also words of the nontarget language are processed right up to semantic level, but as mentioned makes no claims about the effect of language proficiency.

The Distributed Feature Model

Many of the studies carried out on bilingual processing have been done using naming tasks without any form of context, where participants are asked to name concrete objects and concepts that are shared across languages from textbook-type pictures. One may however argue that tasks of this type are far more straightforward than what would be the case if more abstract or culturally dependent concepts were involved. The Distributed Feature Model by van Hell and De Groot (1998) proposes that representations are a result of categories, in which concrete nouns and cognates are shared representations across languages, whereas abstract nouns and noncognates are distinctly represented and specific for each language.

Figure 2, the Distributed Feature Model



From Van Hell and De Groot (1998)

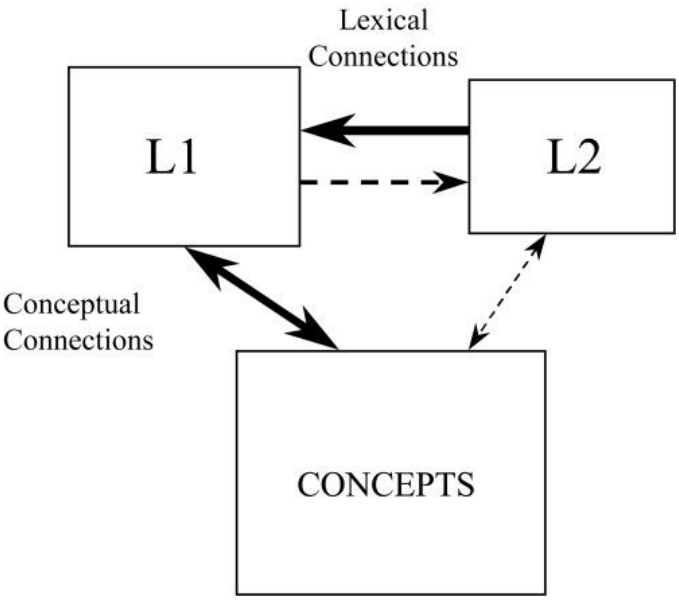
Van Hell and De Groot supported this model through an array of studies in which various tasks, translation production, word recognition, lexical decision and word association all provided the same result- shorter latencies in both recognition and production of translation equivalents with concrete

nouns and cognates. The models reviewed above therefore support the idea that access is both nonselective and influenced by access to a conceptual level. However, the DFM only considers nouns, as mentioned, and thereby takes a relatively limited view on processing, and like the BIA model makes no claims related to L2 proficiency.

The Revised Hierarchical Model

Much like the DFM, Kroll and Stewart's (1994) Revised Hierarchical Model makes use of the notion of "conceptual level" of language. This is, however, the first of the older models of bilingualism to link proficiency and the conceptual level of second language, and is supported by studies such as Silverberg and Samuel (2004) and Talamas et al. (1999). Silverberg and Samuels looked at semantic priming in Spanish-English bilinguals and found that proficient bilinguals showed significant priming effects when a Spanish target word was preceded by a semantically related English prime. This effect was however not found in less proficient speakers. Similarly, Talamas et al. tested English-Spanish bilinguals in a translation task where they were asked to determine whether two words were translation equivalents. In some pairs, one word would not be a translation equivalent, but a word related in orthographic form or conceptual meaning to the second word. In this test, less proficient bilinguals showed more interference from form-related words, whereas the more proficient had more interference from meaning-related words. This relates to the RHM claim that in low proficiency bilinguals, L2 conceptual meanings are accessed through L1 translation equivalents, whereas increasing L2 proficiency will increase direct access to L2 conceptual meaning.

Figure 3, the Revised Hierarchical Model



From Kroll & Stewart (1994: 158).

The RHM is therefore a more developmental model, which claims a greater dependency of L1 mediation in less proficient learners, as L2-L1 translation depends to a greater extent on simple lexical connections and word-to-word equivalency, whereas L1-L2 translation engages semantics, and thereby a longer route from perception to production. The model predicts that L2 conceptual ties will strengthen with increasing proficiency, but as shown in fig. 3, there is nonetheless a stronger left-side connection resulting in an asymmetry which will be found in most speakers. This is congruent with most views in the area of L2 proficiency, Hulstijn cites how an author of the Common European Framework of Reference for Languages (2011) claims that "uneven profiles" are the rule and "flat profiles" are the exception (2011: 243). It should be mentioned, however, that a study by Sunderman and Kroll (2006) which tested English-Spanish bilinguals with varying degrees of proficiency in translation tasks that included both form- and meaning related non-translation equivalent distractors found extensive evidence that although less proficient bilinguals rely more on lexical links through translation equivalents, both less and more proficient learners nonetheless had access to conceptual information. Their study concluded that there was little question that sensitivity to meaning was found regardless of proficiency, but the question was rather what the nature of that sensitivity was. They cite other sources (Jiang & Forster, 2001; Kotz & Elston-Güttler, 2004) which claim that late but highly proficient bilinguals do not have access to the same degree of L2 semantic distinctions as do native speakers. This provides an interesting parallel to Hulstijns later claims that although an L2 speaker can function on a high HLC level, the major differences between a native speaker and an L2 speaker will be on the BLC level, and it is uncertain whether a post-puberty learner can attain L2 BLC at all. The link between proficiency and the conceptual level of L2 is the focus of uncertainty here, and evidence from processing seems somewhat conflicting, but the RHM is nonetheless the first model to acknowledge the importance of proficiency in processing.

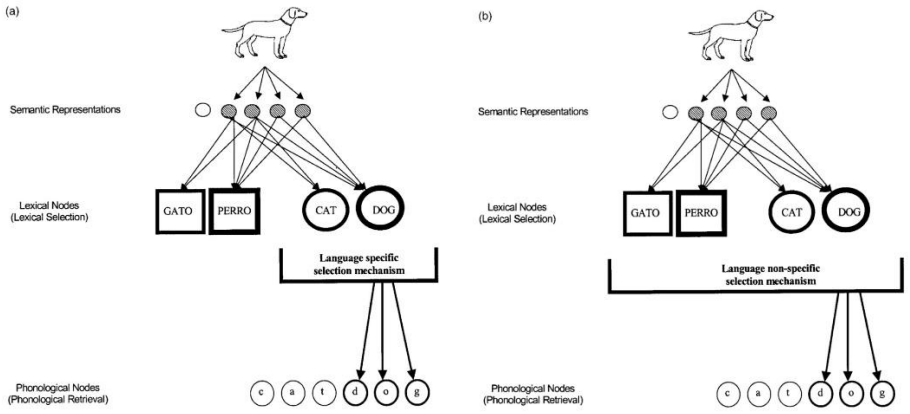
Although the models described above are clear on the nonselective nature of bilingual language activation in processing, the question remains how mechanisms of selection in actual language production functions. The idea of shared representations is much explored and there is considerable evidence supporting it, whether the representations be conceptual (e.g. De Groot, 1993), orthographic (e.g. Bowers, Mimouni & Arguin, 2000; De Groot & Nas, 1991; Dijkstra & Van Heuven, 1998) or phonological (e.g. Pallier, Colomé & Sebastián-Gallés, 2001).

Bilingual selection in production.

Fundamental to the idea of creating any model of bilingualism, is the concept of *access.* When bilinguals choose to use one of their languages, how do they gain access to the processing or

production mechanisms that govern that specific language, and not the other? And further, are these mechanisms shared or separate for each language? The concept of language selectivity is reviewed by Costa (2005) in an article that looks at research supporting two separate views, either that bilinguals have two separate systems governing their language which can be shut on or off according to situation, or that there is overlap to some degree, and activating one language will lead to some activation of the other. Central to Costa's review is the idea that when a bilingual has two words for one concept, speech production is dependent on the selection of one over the other. However, a considerable amount of research (Costa et al., 1999; De Bot, 1992; Dewaele, 2001; Gollan & Acenas, 2000; Green, 1998) suggests that activation of lexical candidates for any given concept is not limited to the language selected for output, but activation spreads proportionately throughout *all* lexical representations of that concept, regardless of language. Thereby, selection is non-specific, or non-selective, one language cannot be shut off during production of another. However, going from there to actual production raises another question of whether activation on the lexical level of both languages also results in activation on a phonological level in both languages.

Figure 4, bilingual speech production.



From Costa (2005: 314-315).

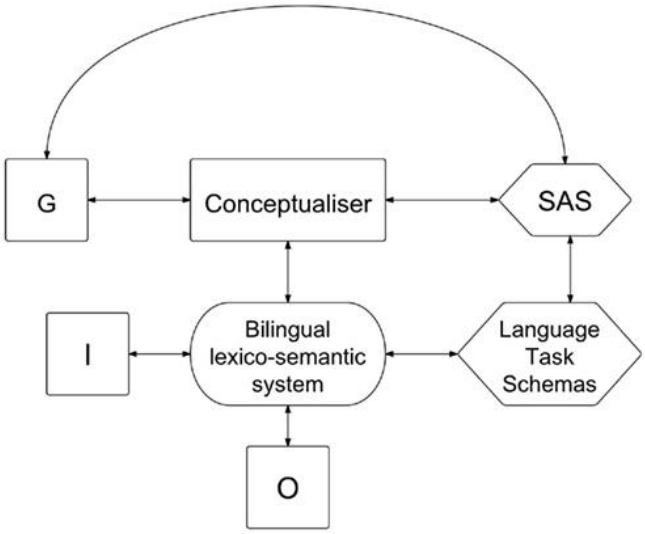
Costa reviewed experimental results looking for evidence of either selectivity or nonselectivity in phonological selection, and concluded that evidence was clearly in favour of nonselectivity in activation from the lexical to the sublexical system, referring among others to a production study by Hermans et al. (1998), where Dutch-English bilinguals were asked to name pictures in their L2 while ignoring distractor words presented in both L1 and L2, which were phonologically related to the target word's translation. The study showed longer naming latencies when the distractor word was phonologically related to the L1 translation of the L2 word participants were trying to produce, thereby showing parallel activation of both L1 and L2. The evidence of further selection and the

activation of actual linguistic representations was, however, less unanimous. However, Costa concludes that phonological encoding must be nonspecific. A crucial point in Costa's attempts to reconcile contradictory findings from empirical research is *proficiency,* citing a study by Poulisse and Bongaerts (1994) showing that the number involuntary L1 intrusions is significantly dependent on L2 proficiency, demonstrating an effect of proficiency even on the level of lexical selection. In the conclusion of his review, Costa points to the thought that several models depend on varying levels of proficiency to account for their results, and he therefore makes the assumption that activation of lexical nodes in the non-response language can affect production performance in less proficient bilinguals, but the seemingly lesser effect observed in more proficient bilinguals can be attributed to a change towards more language selective processing in more proficient speakers (see Figure 4). Although Costa admits that more research is needed to fully establish this as a conclusion, it does nonetheless underpin the emphasis on proficiency in models of bilingual processing and production.

The Inhibitory Control Model

Since cognitive linguistic representations are to such a large extent believed to be shared or overlapping, the speed and rate at which bilinguals are able to switch between their languages is an even more remarkable feature. The very conscious type of code-switching, i.e. intentional shifting back and forth between languages shared between two speakers, has been explored among others by Clyne (1980, 1997), and also by Meuter (2005) who considers the phenomenon of language selection and deselection by looking at the cognitive processes involved in selecting to use one language over the other. This is done by studying how language suppression actually functions, whether it is partial or global, and also whether proficiency is a facilitating factor in selection and suppression. As mentioned in the discussion of the models above, parallel activation of conceptual information in both languages is very much accepted, and that means that a language system, or parts of it must be suppressed in order to produce fluent utterances in one language over the other. Green's Inhibitory Control Model (1993, 1997, 1998, Figure 5) attempts to explain the processes by which bilinguals control their two languages through a process of selection and inhibition.

Figure 5, the Inhibitory Control Model.



From Green (1998: 69).

The ICM hypothesis assumes that lemmas are tagged for language-specific information. The tags are then in turn inhibited or activated by the language task schemas, which control language actions, such as the action of naming a word or picture in one language over another. Competition then occurs in the lexico-semantic system, which is controlled by the task schemas. When a new task is to be carried out, and selection of task schema is no longer done by routine, the SAS (Supervisory Attentional System) will monitor the process and ensure the correct output by either inhibiting all lemmas with inappropriate language tags, or by activating a new task schema appropriate for the task at hand. This means that the competition for selection itself is not affected by lemma selection in one specified language, it is rather the addition of the Supervisory Attentional System and its monitoring of the task schemas that controls the output of the competition. Meuter (2005) mentions that one implication of this model is that a language as whole will be affected when the task schemas selectively activate or inhibit lemmas according to requirements of the task, although inhibitory effects can also be selective and inhibit translation equivalents and their related concepts more strongly than other, non-related concepts. This model is linked to the phenomenon of asymmetrical language switch cost. This phenomenon has been observed in a number of studies (e.g. Meuter, 1994, 2001; Meuter & Allport, 1999; Kroll & Peck, 1998), and shows that switch cost in form of longer latencies in naming tasks was observed to a much larger extent when switching from the non-dominant L2 to the dominant L1. The idea that switching from a non-dominant to a dominant language comes at a greater cost has been seen as somewhat of a paradox, but the ICM explains it as "within-system inhibition" (Meuter, 2005: 355). When a switch from L2 to L1 is performed, a corresponding L1 task schema is chosen, replacing the previous L2 task schema. The L2 task schema

and SAS had depended on a very strong inhibition of all L1 lemmas in order to perform successfully, and the degree of inhibition needed in non-balanced bilinguals is strong to the point that its removal accounts for the greater switch cost observed in an L2-L1 switch. Meuter then goes on to point out that switch costs observed can vary from task to task with the same individual, and that this seems independent of general proficiency. What actually affects the process is the relative proficiency of one language compared to the other.

In summary, although various models provide various foci, there is consensus on the non-selectivity of bilingual processing - bilinguals have both their languages active during processing, and are therefore able to efficiently switch from one language to another. Secondly, proficiency seems to be relevant to processing, as more and less proficient groups show somewhat different patterns in their processing. The nature of these differences may not be completely agreed upon, but proficiency differences seem to be dependent on both cognitive ability, education, professional experience, language exposure and social factors. All models do however focus solely on processing or production in one language over another, and neither provides any explanation of accent in L2.

Bilingualism and foreign accent

When considering the topic of accent in L2 speakers, there are several aspects that must be considered. This section will in turn address the following issues: Where does foreign accent come from, i.e. what theoretical hypotheses seek to explain the phenomenon? Secondly, what factors are considered important in determining degree of foreign accent in an L2 speaker, which as everyone will know varies greatly amongst bilingual speakers. And finally, is accent important? What attitudes surround foreign accent and how does accent influence communication? These questions will in turn lead into a general comparison of English and Norwegian, mainly focusing on differences in phonetics and phonology, which have formed the basis of the test material used in this study.

Functional origins of L2 foreign accent

Most L2 speakers will have some degree of foreign accent. This can, however, vary greatly from speaker to speaker. As the previous section has shown, models of bilingualism generally focus on concepts such as access and selection, even in terms of production, and leave no explanation for foreign accent. There are, however, theories on the functional origins of foreign accent. An introduction to the idea may be abstracted from Perani et al. (1998), who mentions the parameter setting approach used in psycholinguistics. This approach argues that linguistic parameters, in the

meaning ‘sets of permitted variations within a frame of principles that are invariant’, are a part of the universal grammar, and the acquisition of a language means that these parameters are set to a specific value. This will in turn create possible conflicts, both in terms of processing and production, “when the acquisition of L1 requires the fixation of a parameter at one value, while the acquisition of L2 requires a different value for the same parameter” (1998: 1841). Perani et al. give an example from morphosyntax, in which the directionality of modification of noun phrases in English is leftward, whereas in Italian it is rightward, and poses the question of what happens when you learn two languages that require opposite, or simply to some degree conflicting parameters. Will an L1 parameter first be set, and that parameter used for L2 processing as well, or will a different parameter altogether be used for L2 processing? Although Perani et al. consider examples from morphosyntax, one might very well consider the question relevant for phonetic and phonological matters as well. Do bilinguals to varying degrees of success use L1 based language parameters, or do they have two separate sets which can be retrieved and used in different situations?

An extensive study by Roelofs (2003) tested a total of 79 Dutch- English late bilinguals, all relatively proficient, in four experiments. The first experiment tested rightward phonological encoding of L2 words, while the second and third tested shared representations common to both languages. The objective was to ascertain whether representations of common segments shared in both languages could facilitate planning of initial segments also common to both languages without advance knowledge of the language of the word in question. Their hypothesis was that preparation should be possible even when a set of words included words from both languages - the initial /st/ should be facilitated in a set that included the English words *steam* and *stone* as well as Dutch *stoel* ‘chair’. In L1, previous studies had observed preparation effects when responses share initial segments completely, but not when segments vary in some respect of voice, place or manner of articulation, e.g. /p/ and /b/ which share all features except voicing. The fourth experiment tested whether this was also the case for L2 segments. The findings from the four experiments concluded that even bilinguals who are unbalanced in spite of relative L2 fluency showed very similar patterns of preparation across both languages, and this was interpreted to suggest that bilingual speakers can be functionally monolingual in terms of preparation patterns, as segments whenever possible seemed to be shared across languages. It should however be noted that the group tested had an average AoA of over 11 years, thereby making them late bilinguals, and Roelofs does also admit to the degree of phonological overlap between Dutch and English, which may have facilitated shared sound segments. However, due to the observation that participants produced English words with English pronunciation and Dutch words with Dutch pronunciation, shared segments were combined with language-specific segments that placed each word in its correct language. Roelofs mentions

specifically the word *blade*, which by all participants was pronounced as /bleɪd/, and not the phonotactically possible Dutch non-word /bla.də/. The fact that preparation effect was observed as well as correct language pronunciation was considered an argument for shared representations. Roelofs thereby argues in favour of a rightward incremental mechanism planning phonological utterances that is shared between L1 and L2. Thereby the same segments are "recycled" across languages. One might then in turn argue that this sharing of representations leads to foreign accent through analogous use of segments that are similar, but not identical in that they belong in L1, but are nonetheless recycled as L2 segments.

The notion of a shared phonological domain as well as separate language-specific realizations was the basis of a study by Alario et al. (2010), which looked at syllable representations across languages, and tested whether they were shared or language-specific, but this time related specifically to AoA. The study argued that language-specific representations allowed for distinct realizations across languages. Shared representations could, however, be a source of foreign accent if their phonetic realizations were set during early L1 acquisition, remained inflexible, and were used in L2 articulation. This study used timed pseudoword reading to test fifteen early and sixteen late Spanish-French bilinguals, all of which were fluent in French. Participants read aloud 300 disyllabic pseudowords, all consisting of syllables shared across both languages, one pivot syllable and one experimental syllable, with orthographic transcriptions maximizing language idiosyncrasies. Disyllabic filler words consisting of pivot syllables and language-specific syllables were dispersed through the corpus. Participants were tested in two blocks, and primed to each language before each trial. One major result of the study was in a syllable-frequency effect, which was smaller for late than for early bilinguals, and that relative-frequency effect was present exclusively for late bilinguals. Only the late bilinguals were sensitive to syllable frequency in the non-target language. Some have hypothesized that early and late bilinguals both have distinct syllable representations for L1 and L2 respectively, but whereas early bilinguals selectively activate representations of the target language, late bilinguals activate representations of both languages. This is however opposed by Alario et al. (2010), who in contrast claim that early bilinguals have separate representations even for shared syllables, whereas late bilinguals use the same representations for speaking in both languages. This further expands on Roelofs' (2003) notion of use of L1 segments in preparation of L2 speech, however expanding it to consider AoA as a factor for the degree to which this happens. Both studies nonetheless conclude that foreign accent results from using representations drawn from L1 which may be reasonable approximations of L2 realizations, but nonetheless produce non-native patterns. A review by Strange (2007) also considers the notion that how L2 segments are perceived is influenced by automatized perceptual strategies that try to recognize incoming phonetic segments as

examples of phonological categories from L1. Through this mechanism, L2 phones are *perceptually assimilated* to L1 categories. All of these studies support a claim initially made by Grosjean (1982) that bilinguals are not, and should not be considered, two monolinguals in one body.

Returning once more to AoA, its importance in degree of foreign accent had previously also been considered in Flege, Yeni-Komshian and Liu (1999), who evaluated the hypothesis of a critical period by considering the relation between AoA and L2 performance. 240 native speakers of Korean who had arrived in the USA between the ages of 1 and 23 were tested using a profiling questionnaire and grammaticality judgement test. They also produced sentences that were rated for foreign accent by a panel of ten native speakers of English. The two major results of the study were not unexpected. Firstly, the degree of foreign accent in participants' English increased with AoA, and scores of grammaticality judgement similarly decreased. Secondly, there were greater differences between the native Korean speakers and the L1 English controls in the phonological than the morphosyntactic test. In terms of testing for a critical period, there was no evidence that scores for phonology changed drastically as participants' AoA drew closer to the end of the proposed critical period, however this nonlinearity was found for morphosyntax test scores. According to the critical period hypothesis one would have expected a correlation between AoA and L2 performance for learners whose AoA was before the age of 12, but not for those who had learned their L2 at a later stage. However, as AoA-morphosyntactic performance correlations were found for both the 2-12 years group and the 13-23 years group, no actual evidence for a critical period in either domain was found.

One important factor influencing accent in particular could be drawn from the background questionnaire used by Flege et al. (1999), namely the participants' use of English in daily life. In terms of accent, the participants who used English to a greater extent in daily life had less noticeable accents than subgroups identical in AoA but with less L2 language use in daily life. One might argue that participants who used their L2 more would obviously use their L1 less, but Flege et al. hypothesize that the language-use effect observed need not necessarily be due to a lower frequency of L1 use, but rather a higher usage of L2. They argue that the more L1 is used, the more it will influence negatively a learner's knowledge of L2 pronunciation- as well as lexically based morphosyntax, and they propose for future research a hypothesis that infrequent use of L2 is an *effect* of poor performance in the language, not a *cause.* Nonetheless, Flege et al. concur to the idea that age-related changes in L2 pronunciation are results of learners relating L2 sounds to sounds from their L1 phonetic inventory, thereby producing sounds that are to some degree similar, but not identical. They argue that although the AoA effect on accent may be partially due to matters of brain maturation, it seems more likely that it relates to changes in how L1 and L2 phonological systems

interact as the L1 system develops, thereby deeming it unlikely that a critical period for phonological proficiency is actually significant.

How important is foreign accent?

As reviewed in the previous section, researchers generally agree that some degree of foreign accent is found in most L2 speakers, but another question altogether is how important the matter of foreign accent is considered. As theories of functional origins are in relative accordance on the causes, what are the effects of accent in terms of attitudes and communicative efficiency?

Moyer claims that "despite decades of research, contradictory findings have uncovered more questions than answers when it comes to explaining the pervasiveness of accent for late second language (L2) learners" (2007: 502). The article then goes on to mention that a number of factors have been shown to influence accent, many of them sociopsychological, including "concern for pronunciation accuracy, sense of identity, motivation to learn the target language and attitudes toward the target culture" (504). Moyer considered 42 non-native speakers of English and eight native controls, all students at a US university, in a study consisting of a questionnaire on background and attitudes and a five- part read aloud- and free speech test. Moyer found that length of residence was important and maybe even crucial to accent, but its impact was not immediately apparent. This effect really only came into full impact before after about ten years, when language dominance is likely to shift from L1 to L2, and this supports results from Flege et al. (1999). Moyer did however find important correlations between several sociopsychological factors. Learners that had more opportunities to use their L2 tended to have more positive attitudes towards both the target language and its culture, which led to more confidence in language abilities. With that followed an observed awareness of one's own accent and the development of strategies, both social and cognitive, to improve the accent. Moyer found that learners who judged themselves as highly fluent tended to also rate higher for native-like accent, and also that many learners were aware of both their own accents and the often negative reactions towards their speech by native speakers. Learners were often able to mention specific phonetic contrasts and patterns that they struggled with, and devised strategies to improve and practice their pronunciation. In conclusion, Moyer does nonetheless mention that the drive towards 'nativeness' or something close to it as learning goal is often at the cost of the more realistic goal of 'intelligibility'. It is completely possible to successfully communicate without a native-like accent, as long as the degree of foreign accent does not come at the cost of comprehensibility and intelligibility. This view is supported by Munro and Derwing (1995) who discuss the traditionally negative bias against foreign accent in L2 teaching, and the fact that

studies have shown that accented L2 speech tends to be downgraded simply because of the accent. The existence of courses in accent reduction, where the goal is to 'sound like a native speaker' is considered problematic not only in light of the fact that we know that some degree of accent is more or less an inherent trait of L2 speech, but also due to the traditional notion that accent hinders communication. Munro and Derwing mention how research in that field up to that point had been inconclusive. Gynan (1985) claimed that in the speech of Spanish-English bilinguals phonology was a greater hinderance to comprehension than grammatical errors, whereas Ensz (1982) concluded the opposite for English-French bilinguals. Politzer (1978) had found that vocabulary errors were the greatest comprehension hinderance to English- German bilinguals. The same went for nonnative patterns of pronunciation, they were deemed important in some studies, and trivial in others. Munro and Derwing (1995) claim that studies in this area are sensitive to differences in target languages as well as methodology, and also mention problem that intelligibility, "*the extent to which a speaker's message is actually understood by a listener*" (289), has no universal method of assessment. Their own study asked listeners to write out sentences produced by nonnative speakers which were then scored in terms of deviations between transcripts and actual utterances. Listeners then rated the perceived comprehensibility of the sentences, and these scored were compared to the speakers' degree of accentedness. The speech samples were from ten native speakers of Mandarin, all proficient in English, but with varying degrees of accent. Listeners were 18 native speakers of English. The results from this study showed that the number of grammatical errors made by L2 speakers correlated significantly with phonetic and phonemic errors. Speakers who made grammatical errors also tended to make pronunciation errors, but within the area of pronunciation there was a lack of correlation between phonetic and phonemic errors and intonation errors. In terms of intelligibility and comprehensibility, more than half the transcriptions were rated as 100% intelligible. Although the utterances they were based on were to a large extent considered within the 'heavily accented' range, they also rated high for perceived comprehensibility. The scores were interesting in that listeners tended to be more critical when scoring accentedness, resulting in several utterances being considered heavily accented, but were nonetheless perfectly transcribed- thereby suggesting that a heavy accent need not influence comprehension and intelligibility. Listener judgements had strong correlations in terms of accentedness and errors in phonetics, phonology and intonation, however few correlations were found in terms of these factors and comprehensibility, and even fewer in terms on intelligibility. As this study used passages extracted from reading tasks that more strongly resembled natural speech than research materials in many other studies, it seems they are also better measures of an actual communicative situation. Munro and Derwing claim that these results suggest that in both language teaching and language research, it should be remembered that accentedness is not necessarily a cause of low comprehension and intelligibility. Comprehensibility

judgement may very well vary greatly from listener to listener, but overall, there is no reason to claim that little accent and high comprehensibility versus accented and hard to understand are necessarily end points of a scale.

In summary, there is general agreement that foreign accent is the result of using L1 settings in L2 articulation, and thereby producing similar, but not identical patterns of pronunciation. Although the existence of a critical period is disputed, findings generally show a pattern of better performance in younger learners. Also, although near-native pronunciation has generally been a goal of foreign language instruction, and despite the negative bias against accented speech, some research has suggested that foreign accent has little effect on comprehension and intelligibility of speech.

Linguistic comparison

As a major part of this thesis has been testing L2 speakers of English in a battery of proficiency tasks measuring various aspects linguistic ability of English, it has been important to make sure that the tasks are designed in a way that reflects some of the major differences between Norwegian and English. The intention has been to establish central points of divergence between the two languages, known to cause difficulties for Norwegian learners. Standardized tests could then be adapted according to those points so that they focus primarily on factors that are known to be challenging specifically to speakers with Norwegian as their first language. This section will survey key differences between the two languages, and how they have affected study design.

General background

English and Norwegian language are closely related, both stemming from Proto-Germanic. Although the modern languages are members of different Germanic subgroups, English and Norwegian belonging to the West and North Germanic language group respectively, their common origin is evident in many respects of both morphosyntax, phonology and vocabulary. Also, geographic proximity and Old Norse influence on British areas have led to a further number of historic loan words between the two languages - as has modern cultural impact through media provided a number of more recent loans. Common origins and a large number of loans are reasons for the number of lexical cognates shared between the two languages, such as *hand/hånd, wind/vind, thing/ting,* etc. Several English loans are also firmly established in Norwegian, such as *boots, booke* – 'to book', *klubb* – 'club'.

This study has involved testing Norwegian-English bilinguals on a number of different areas of second language proficiency. In terms of language production, factors include general pronunciation, grapheme to phoneme conversion, phoneme to grapheme conversion, vocabulary and morphosyntactic judgement. The following section will look at a number of key linguistic differences which formed the basis for the stimulus material used in the test battery.

In terms of comparing the two languages, it must be considered that both Norwegian and English have a number of regional accents and dialects with specific features that can dramatically differ from region to region. The participants in this study have been speakers of several different dialects and accents, both L1 and L2, and since target dialect has been difficult to know, the comparison and subsequent test design have been based on general differences, rooted mainly in so-called 'standard varieties'. It needs, however, to be considered what these 'standard varieties' actually are. No standard spoken variant of Norwegian exists, to the point where the Norwegian Language Council does not publish or endorse official pronunciation dictionaries as a norm of Norwegian speech. The reason for this is official language policy which does not allow official preference of one dialect over another, and consequently pronunciation is not taught in Norwegian schools. Norwegian language policy will be described further later on in this section. This comparison will use *Standard Østnorsk* (Standard Eastern Norwegian/SEN) as its point of reference. This variety is based on formal middle-class urban speech localised in the eastern part of southern Norway and is also the variety mainly referred to in Kristoffersen's *The Phonology of Norwegian* (2000). It should be noted that this variety is not local to the area where research for this thesis has been carried out, however, the participants in this study have not been limited to the local area and thereby represent several Norwegian regional dialects.

There is indeed an officially recognised spoken variety of British English, the actual usage of it is however disputed in terms of number. *Received Pronunciation* (RP) is, although based on Southern English speech, a non-geographical variety used in English language teaching worldwide. This standard variety has strong ties to the public school system, and is used in daily speech, albeit by a very small number of speakers. It is also strongly connected to high social status, and therefore different from the situation in Norway, where no spoken variety is officially recognised as higher status. These two varieties will nonetheless form the basis for the phonetic and phonological comparisons, as these varieties are the two mainly used in school text books and are also generally used in phonetics courses at university level. Standard American English is also to an increasing degree included in education in recent years, reflecting the increased use of American accent among younger learners, mainly due to media influence. The main features of both SEN and RP are well

documented and thereby suited to be compared and contrasted in a general way. The audio material used in testing was recorded by a speaker using a near-RP accent.

Phonetic inventory

RP and SEN are relatively similar in terms of number of phonemes, with 24 and 23 consonant phonemes in addition to 20 and 25 vowel phonemes respectively. There are, however, distinct differences distribution of phonemes within these groups, and they will be described in turn below.

Table 1. Differences in consonant inventory

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Glottal	Labiovelar
Plosive	p b			t d		ʈ ɖ		k g		
Nasal	m			N		ɳ				
Tap/flap				ɾ		ɽ				
Fricative		f v	θ ð	s z	ʃ ʒ	ʂ	ç		h	
Affricate					t͡ʃ d͡ʒ					
Approximant		ʋ		ɹ			j			w
Lateral				L		ɭ				

Shared consonants are in black, English-specific consonants in green and Norwegian-specific in red. Adapted from Kristoffersen (2000) and Nilsen (2010).

The following RP consonant phonemes are lacking in SEN:

- Dental fricatives /θ, ð/ tend to be substituted for dental stops /t,d/ by some Norwegian speakers. This causes a lack of distinction between words such as *through/true* and *this/diss.*
- The postalveolar affricates /t͡ʃ, d͡ʒ/, are found only in some regional dialects in western areas of Norway, and Norwegian speakers tend to substitute sequences like /tç,dj/, and the choice between them is often unclear, resulting in a lack of distinction between words such as *choose/juice.*
- The voiced alveolar fricative /z/ is not found in any Norwegian variety, and L1 Norwegian speakers often the voiceless counterpart /s/, causing a lack of distinction in pairs like *peace/peas.*
- The voiced postalveolar fricative /ʒ/ is also absent from SEN and often substituted for /ʃ/. As the voiceless variant is only found in some variants of Norwegian, it is also common to substitute either sound for /sj/. This causes a lack of distinction in pairs like *jus/shoe.*
- The labio-velar approximant /w/ is not found in Norwegian. The absence of this sound, in addition to the fact that the phonetic realisation of letter <v> being labiodental fricative /v/

in RP and labiodental approximant /ʋ/ in SEN, often leads to considerable confusion for Norwegian learners. They often substitute their native /ʋ/ in both instances, usually giving both sounds a quality that makes /v/ sound like /w/, leaving no distinguishable difference between the first sounds of each word in the phrase *very well.*

Marginal differences between sounds often perceived to be identical are also factors of confusion for Norwegian learners of L2 English.

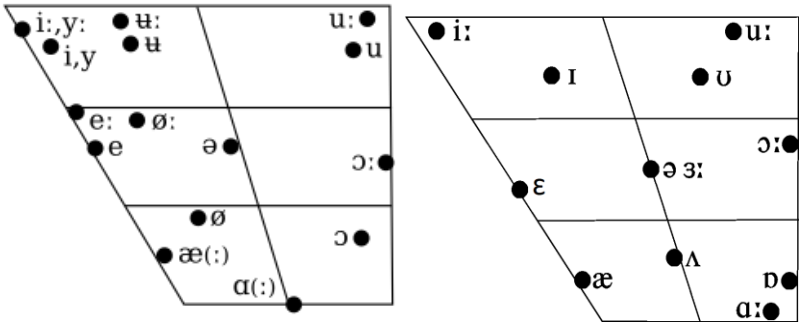
- Articulation of the English postalveolar approximant /r/ can be a challenge to some Norwegian learners, as Norwegian has several different phonetic realisations of <r>, depending on regional dialect. Some areas use a uvular fricative or trill, in SEN, however, the general tendency is to use an apical trill. Sound sequences of postalveolar approximant followed by alveolar plosives are also often realised as a retroflex by SEN speakers.
- Another major difference relates to the general use of retroflex sounds in SEN. Kristoffersen (2000) has formulated the so-called Retroflex Rule, stating that with only a marginal number of exceptions, sequences of /r/ followed by /t, s, n, l/ are merged into retroflex sounds /ʈ, ʂ, ɳ, ɭ/. Similarly, across a morphological or syntactic border, all sequences of /r, ɽ/ followed by the same unmarked coronals including /d/ are merged into /ʈ, ʂ, ɳ,, ɭ, ɖ/. This leads to pronunciations such as [sʊɑʈ], *svart* 'black', [ʊœʂ], *vers* 'verse', [bɑːɳ], *barn* 'child', [jɑːɭ], *jarl,* 'earl', [hɑʈ], *hardt, '*hard' (adv). This can have consequences for articulation in L2 English. English alveolar plosives /t, d/ are often substituted for retroflex postalveolar plosives /ʈ, ɖ/ when preceded by <r> in orthography or /r/ in pronunciation. This leads to realizations such as *heart - */*hɑːʈ/. The same issue applies to alveolar nasal /n/, which can often be realized as retroflex nasal /ɳ/. Retroflex sounds are only found in some variants of Norwegian, but other variants often have dental realizations of the corresponding English alveolar plosives as well as the alveolar nasal, although this generally is not an issue for comprehension.

Differences in vowel inventory

In terms of number, RP has a slightly smaller set of vowels, 12 monophthongs and 8 diphthongs, whereas SEN has 19 monophthongs and 6 diphthongs. There are, however, some key differences within these groups.

Monophthongs

Figure 6- Vowel inventories

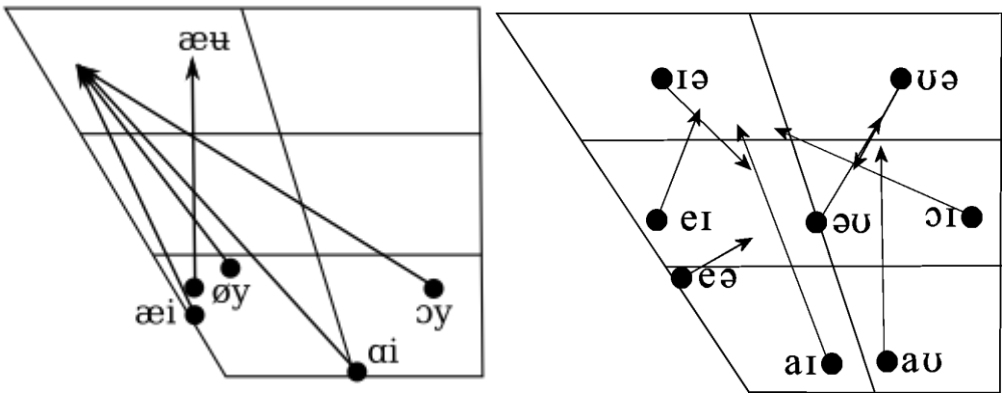


SEN vowel chart left, RP vowel chart right. Adapted from Kristoffersen (2000) and Nilsen (2010).

- The central monophthongs /ɜː, ʌ/ are not found in SEN phoneme inventory, and their pronunciation tends to be challenging to Norwegian learners. Most substitute their more native /ø/ or even an English /ɔ/. This leads to realizations such as *nurse- */nø:s/* and *hut- */høt/.*
- Back monophthongs /ʊ, uː/ are often substituted for a Norwegian /ɨ/, which is a front vowel with very strong lip-rounding. SEN front rounded vowels are not part of the English phoneme inventory, and difficulties with these tend to go both ways. The near-close near-front rounded monophthong /ʏ/ is often realized like /iː/ by L2 speakers of Norwegian. This relates to Norwegian pronunciation of RP short close-mid front monophthong /ɪ/, the Norwegian counterpart being fully front, thereby making the distinction between the long and short variants more difficult to Norwegian speakers, and thereby also the distinction between words like *this/these.*
- Another difference is the unstressed central vowel /ə/, which is widely used in all unstressed positions in English. Its distribution is different in SEN, where it only occurs as an allophone of /e/, and this will often cause native speakers of Norwegian to articulate it closer to an /e/ in word-final position. In non-final position, many Norwegian speakers tend not to reduce vowel although in an unstressed position, thereby pronouncing *sofa* and *sister* /səʊfɑ/ and /sɪste/.

Diphthongs

Figure 7- Diphthong inventories.



SEN diphthongs left, RP diphthongs right. Adapted from Kristoffersen (2000) and Nilsen (2010).

Some differences are also found in the diphthong inventories.

- English front-closing diphthongs are different from those found in SEN in that the Norwegian counterparts have a closer and tenser second element. Kristoffersen (2000) actually considers the SEN diphthongs to generally be short vowels followed by palatal glide [j] except for one instance of /w/.
- SEN does not have any back-closing diphthongs and native speakers of Norwegian often have problems with these, but not so much with the actual articulation as with determining which variant is used in a given context, thereby struggling with distinctive pronunciations of pairs such as *bough* and *bow* (noun).
- There is also a general absence of centring diphthongs in SEN, and native Norwegian speakers tend to often reduce them to monophthongs, thereby pronouncing *here* and *bear* */hɪ:/ and */bɜ:/.

These key phonetic differences have been the basis for a body of tests looking at participants' ability to pronounce English-specific sounds, in both a general pronunciation task, a grapheme to phoneme task and general tasks of sound repetition and manipulation. Other tasks, like a spelling test, have taken an opposite approach, looking at participants' ability to go from auditive stimuli to written form.

Grapheme-phoneme encoding and decoding

Languages vary drastically in their degree of consistency and transparency in mappings between spoken and written language. Whereas some languages have a strong 1:1 relationship between grapheme and phoneme, other languages are considerably less transparent. This affects both pronunciation and spelling in that the varying degree orthographic form is indicative of sound structures and vice versa. Moll et al. (2014) describe how English orthography "with its many

complexities [is] probably on the most extreme end of this continuum of orthographic consistency" (2014: 66). They go on to describe how the development of decoding skills takes considerably longer in English that in languages with more consistent orthographies, and the opacity of the mapping system tends to cause particular complications to young learners. Wimmer and Goswani (1994) also claim that in German, there is much more consistency in grapheme to phoneme mapping, particularly where vowel graphemes are concerned. Therefore, when learning to read, young German readers could thereby use grapheme-phoneme translation from the very beginning. But as grapheme to phoneme mapping in English is much more opaque, young readers of English will be much more likely to use varieties of direct access strategies. This could mean memorizing spelling patterns and thereby building up a lexicon of orthographic recognition units. From these units, spellings of new words can be deduced by analogy, and similarly, context can be used to derive grapheme to phoneme mappings in different situations. Their study suggests that in an early reading process, German children are able to read and pronounce words in their first language based on analogy, the knowledge that one specific sequence of graphemes represents a specific sequence of sounds. English children, however, are to a much larger extent dependent on a direct approach requiring specific recognition of individual words, due to the irregular and opaque nature of grapheme-morpheme relationships.

Although English and German are both West Germanic languages and therefore more closely related to each other than to Norwegian, this contrast is also indicative of the situation faced by Norwegian learners of L2 English. English spelling and pronunciation is to a large extent affected by a considerable number of loanwords from several different languages, many following patterns which are considered part of the loan. Kessler and Treiman (2003) list three ideals for English spelling:

- Conservatism - spelling is very rarely adjusted once it has been accepted, and will therefore often represent for instance archaic pronunciations that are no longer (widely) used, such as a distinction between words beginning in <w> and <wh>.
- Unadapted spelling of loanwords. Latinate origin words are spelled as they would be in Latin.
- Representation of nonphonemic information, such as morphemic information. The <ph> in *phone* is retained due to its importance in invoking the Greek word for sound, although language users may not be consciously aware of this.

In Norwegian, the situation has been extremely different. From about 1500 to 1850, Norway was under Danish rule, and had no other written language than Danish. Even after gaining independence from Denmark, the creation of a uniquely Norwegian written language was a long process. In 1887 the Norwegian government established that written language in schools, which was at that point still

Danish, should be pronounced in accordance with Norwegian pronunciation, although Danish spelling was still retained. In 1893, it was further established that Norwegian textbooks would have Norwegian spelling. The process of establishing spelling norms took a long time, and resulted in two different written languages, *nynorsk,* based on traditional dialects of the western areas of Norway, and *bokmål,* based on the Danish language but with spelling adapted to fit Norwegian pronunciation. The view that spelling should reflect pronunciation would be representative of Norwegian language policy in years to come, and the Norwegian Language Council has, on assignment for the Ministry of Culture, established several new spelling norms, the last one in 2005. The general ideal of these norms has been to ensure a greater degree of regularity, as well as spellings that are in accordance with Norwegian principles of pronunciation. This has also led to several changes in spelling of loan words, many of which have been given a relatively phonetic spelling, e.g. *champagne* changed to *sjampanje, service* to *sørvis.* Norwegian spelling does, to a much greater extent than English, aim to be regular and indicative of pronunciation, the main exceptions being a number of silent letters, e.g. *god,* pronounced /gu:/, and a number of double consonants found in spelling but not reflected in terms of consonant length in pronunciation. In English, however, Kessler and Treiman (2003) report that a phoneme on average has twelve alternative spellings, listing 15 alternatives for /ɛ/, ranging from <e> in *men* to <eo> in *leopard* and <ue> in *guess.* This general opacity leads to considerable difficulty for second language learners of English, and the claim made by Wimmer and Goswani (1994) about different strategies needed for learning in English and German seems to also be relevant to Norwegian learners. The ability to both spell and pronounce English words will be dependent on more direct access to, and knowledge of the word in question rather than general rule-based analogous knowledge. A further complicating factor is the fact that several loanwords that occur in both English and Norwegian have retained original spelling in English, but been normalized in Norwegian, e.g. *photography/fotografi.*

The test material for this thesis challenged participants in both grapheme- phoneme conversion in a pronunciation task, as well as phoneme-grapheme conversion in a spelling task. Both tasks included words of different degrees of regularity, as well as loanwords from various languages.

Morphosyntax

The main morphosyntactic differences between Norwegian and English relate to inflection. According to Olsen (1998), the most common morphological errors made by Norwegian bilinguals are related to inflection of verbs in English. Norwegian verbs are not inflected for number or grammatical person, often leading to Norwegian speakers making subject-predicator concord errors in English. Norwegian

verb forms remain constant throughout the paradigm, as in *jeg går, han går, vi går,* 'I walk, he walks, we walk', making the third person singular -s-inflections in English a source of errors. This also applies to number. Many native speakers of Norwegian struggle particularly with coordinated noun phrase subjects differing in number, e.g. *the girl with the new shoes.* Many speakers of L1 Norwegian would have the verb agree with the closest noun, in this case *shoes,* instead of the head noun *girl,* thereby erroneously choosing a plural verb form- **The girl with the new shoes were waiting for the bus*. The lack of a parallel in Norwegian morphosyntax makes subject-predicator concord one of the more challenging factors for L2 learners of English.

Syntactically, Norwegian and English generally follow the same word order principles, with one major difference- the placement of the predicator. Whereas English follows a SPOCA pattern in which the finite verb form directly follows the subject of the clause, Norwegian has V2 word order, where the finite verb form can only be preceded by one constituent. This can in some instances cause errors in word order, in instances where a sentence has extraposed initial elements, Norwegian word order demands subject-predicator inversion to retain the verbal in second position in the clause. For instance, in sentences with fronted obligatory adverbials, the finite verbal will follow the adverbial and precede the subject, as in *I dag har jeg lest en bok* , *'Today have I read a book'.

The test material for the study included a timed sentence grammaticality judgement task that focused on these two factors, subject-predicator concord and subject-predicator word order, in which participants had to judge whether sentences were grammatically correct. This task was designed primarily to challenge participants' ability to recognize incorrect subject-predicator concord due to use of coordinated subjects differing in number and word order differences due to extraposition of constituents. As a combined set this battery of tests covered main differences between Norwegian and English as well as more general measures of proficiency in vocabulary and reading comprehension. The complete set gave an overall impression of the participants' general L2 proficiency.

Establishing reliable bilingual profiles

As second language proficiency is very much determined by several different factors, these must then be taken into consideration when researching the field, and this is done by establishing background profiles, going into some degree of detail on the factors mentioned in the previous sections. One factor is cognitive ability, and some researchers have indeed included specific tests of cognitive performance into their background profiling. Sunderman and Kroll (2006), working on

results from Kroll et al. (2002) used a reading span task in order to test cognitive performance of high and low proficiency groups of bilinguals. This type of test was however in that study included to ensure a relative uniformity in cognitive performance among participants, thereby ensuring that scores on actual language tests were due to language experience, not abilities of cognitive processing.

Cognitive ability aside, there are a number of factors that must be considered in order to establish a reliable profile. Grosjean (1998) has proposed the following setup:

Table 2- Bilingual profiling

Language history and language relationship:	AoA for L1 and L2, acquisition context, years of education in L1 and L2.
Language stability:	Process of acquisition, language restructuring (access to languages due to context)
Language use:	L1 and L2 spoken and used in home/school/work settings.
Language competence:	L1 and L2 skills in listening, speaking, reading and writing.
Language mode:	Percentage of L1 and L2 use in a monolingual and bilingual context.
Biographical data:	Age, socio-economic, educational status etc.

As this model shows, language competence (proficiency) is simply one factor in an extensive list of mutually affecting factors. As the present study considers processing in terms of performance in language tasks it has been important to be able to establish reliable background profiles of participants. The norm in bilingualism proficiency studies has been to compare a profile that includes background data as well as self-assessment of proficiency to actual performance on language tests. As argued in Hulstijn (2011), assessing levels of L2 proficiency needs more extensive profiling and testing than many of the often-used tests (IELTS, TOEFL, TOEIC) are capable of giving, and several attempts have been made to provide a framework to assess test performance. A number of studies have used self-assessment of linguistic competence in order to profile bilingual learners in studies that have had widely different foci. Jia et al. (2002) focused on grammatical ability, Flege et al. (2002) on degree of foreign accent, and Vaid and Menon (2000) looked at computational language. All of these studies used various questionnaires in order to establish profiles that could be considered for correlation to test performance. The questionnaires included factors such as AoA, settings of

acquisition, years of language education, use of languages in various settings, as well as self-assessment in the factors tested. Results across several studies have shown that bilingual language profiling is best done by considering both language experience and linguistic performance across several domains, but a recurring issue has been the lack of uniformity in methods of creating the profile. As profiling factors were chosen according to specific measures being tested, a tendency was to only focus on factors known to, or assumed to correlate, for instance AoA is assumed to relate strongly to matters of phonology, but less to morphosyntax. This in turn caused problems for cross-study comparison, as different factors were included, and often also rated and assessed in different ways and on different scales. As many studies have shown (Chincotta and Underwood, 1998; Flege et al., 1999, 2002; Jia et al., 2002; further review in Marian et al. 2007), self-assessment profiles usually provide relatively reliable foundations for testing that correlate well with actual performance, but the lack of procedural uniformity has caused problems for generalization.

For the purposes of this study, it was important to establish reliable profiles for participants that allowed for a wide range of practical tests, and that would also provide a corpus of material with a potential for subsequent testing across other fields. For this purpose, we have used as starting point the Language Experience and Proficiency Questionnaire (LEAP-Q). The LEAP-Q was devised by Marian, Blumenfeld and Kaushanskaya in 2007, and the aim of their project was to create a "reliable and valid questionnaire for efficient assessment of bilinguals' linguistic profiles" (2007: 942). Building on the idea that L2 acquisition should be viewed as an interplay between both proficiency and experience, and studies showing that language history was a better predictor of L2 performance than dominance ratings, the LEAP-Q was based on question types previously used in self-assessment studies. Its overall aim is to give an overview of the various factors that have been identified as important when assessing bilingual language users. These factors were identified as "language competence (including proficiency, dominance and preference ratings); age of language acquisition; prior language exposure; and current language use" (2007: 943). The LEAP-Q breaks these factors down into separate areas:

- Language competence is as mentioned viewed in terms of proficiency, dominance and preference. Proficiency ratings are given in terms of reading, writing, speaking and listening. Dominance is rated in terms of general dominance and task-specific dominance, whereas language preference is rated in task-specific terms. The inclusion of all three factors, and also both general and task-specific circumstances, gives the possibility of looking at each factor separately against any area of interest.

- Language acquisition can be viewed in terms of several different factors, what is generally agreed upon by most is that age of acquisition is closely connected to performance, particularly in some tasks. In order to give a substantial platform for research on these covariables, the LEAP-Q measures age of initial language learning, age of attained fluency, age of initial reading and age of attained reading fluency for each of the participant's languages. In addition, participants are also asked to describe learning environments and to what extent these have been considered important to acquisition in each language.
- Language exposure is measured in terms of four different environments, in a country where the language in question is spoken, at school, in the workplace and at home. In addition to previous exposure, the LEAP-Q collects information on the participant's current language exposure, both in terms of actual interpersonal interaction, but also more multimodal types of exposure, through different types of media.

One strength of the LEAP-Q is that it is not language specific and can produce valid results with any type of language combination. For that reason it does not create subgroups of bilinguals, but rather analyses results in terms of L1 vs L2, thereby giving the possibility of considering participants' language experience as a whole, and correlations between their background profile and reported competence in both languages. The LEAP-Q is the result of two studies, the first one aiming to establish internal validity of the questionnaire through factor analysis and multiple regression analyses of responses of 52 bilinguals. The second study aimed to establish criterion-referenced validity by comparing the self-assessment scores and actual standard proficiency measures in both languages in a different group of 50 bilinguals through correlation and regression analyses. Study 1 entailed simply the preliminary version of the questionnaire being administered to the participants, whereas study 2 included behavioural tests. These behavioural tests consisted of a reading fluency test, a passage comprehension test, a productive picture vocabulary test, an oral comprehension test and a sound awareness test. Analyses of results found that some factors were specific to either study 1 or 2, thereby suggesting that the LEAP-Q is versatile enough to be used in studies aiming to reflect both general aspects of bilingualism as well as more specific aspects when looking at bilingual subgroups. Study 2 gave strong conclusions on both the correlations between self-assessed proficiency and actual test performance, as well as the predictability of performance in tests, based on the same self-assessment scores. Another important conclusion across both studies was how language history was more indicative of test performance in L2 that in L1. Whereas age of reading and attained reading fluency was the only language history factor found to greatly influence L1 understanding, a much wider set of predictors was found for L2 proficiency. This makes the LEAP-Q a

suitable tool for predicting language performance even when performing direct tests on participant is not possible.

In summary, through multiple tests and analyses the LEAP-Q has been shown as a reliable and valid tool in creating bilingual profiles, as well as providing prediction on the relationship between self-assessed and actual behavioural scores of proficiency. It is intended for use in healthy adult bilinguals and multilinguals with high school levels of literacy, and due to its comprehensive nature has been chosen as ideal for this present study. The method of combining the LEAP-Q with an extensive set of behavioural tests is also in congruence with views in Hulstijn (2011) on assessment of L2. He also set some basic propositions as corner stones for this type of assessment - that an L2 exam is not an effective means to test whether someone has native or near-native L2 proficiency, that a finite native speaker level in language processing does not exist, and that native speakers differ very much in their language proficiency, "due to differences in age, intellectual skills, education, occupation and leisure-time activities" (2011: 244). For that reason, studying bilingual processing must involve considering test subjects' language history as a whole - L1 as well as L2, as well as at least five assignments, including tests of vocabulary, grammar and spelling. However, many of the previous assessment methods considered by Hulstijn stress the communicative aspects on L2 use in order to establish level of competence. This entails another important dimension- spoken language. Interview situations or other assessments of spoken language are important parts of many of the assessment strategies, and for that reason, assessment can and will be made not only on the criteria shared by all modes of language, but also on those specific to spoken language. This means also considering the central focus for this study- foreign accent in L2 speakers.

Focus for present study

As English is taught in Norwegian schools from the age of six, and is taught for a minimum of ten years, the general Norwegian speaker of L2 English is an early bilingual with a minimum of ten years of formal experience with the English language. This thesis builds on a large number of studies that have considered both accent and general language proficiency, but adds to this research in three key ways:

Firstly, Norwegian-English bilinguals have been asked to self-rate their language proficiency on a more detailed set of linguistic skills. Secondly, novel data has been collected relevant to accent proficiency and attitudes towards accent in both L1 and L2. Finally, objective performance data has been collected using a battery of proficiency tests that measure performance on a comprehensive

set of linguistic skills. The primary aims of the study are to consider the connection between L2 accent proficiency and other areas of linguistic proficiency and background data, and to measure how self-rated linguistic skill measure up to actual performance data, including speech- and accent related data. This can be formulated in the following research questions:

1. How does accent proficiency relate to other aspects of bilingual profile? Which other related variables is accent seen to cluster with in factor analysis?

2. Does rated accent proficiency predict any aspects of objective language performance?

Based on the literature reviewed for above, one might make certain predictions about the general effects one expects to see:

- As Norwegian learners are considered early bilinguals, research suggests that a general high proficiency of grammar and rule-based proficiency will be observed, and thereby high scores in morphosyntactic tasks. Some previous research also suggests that we should observe a relation between early bilingualism and accent proficiency.
- Participants who rate themselves highly in terms of L2 accent proficiency will score accordingly in speech-related tests such as elision and nonword repetition. However, if accent proficiency is closely related to other aspects of L2 language proficiency we should observe significant relationships between rated accent proficiency and scores in tests of lexical and grammatical L2 processing.
- In terms of background variables, accent is expected to cluster with other speech-related variables, such as proficiency in pronunciation and understanding.
- Another expected clustering is accent and L2 exposure in terms of communicative settings, primarily in an L2 setting such as L2 speaking country, family, circle of friends or school/workplace.

Method

Aim of experiment

The aim of the experiment was essentially tripart - to establish linguistic background profiles on a set of English- Norwegian bilinguals, to have them self-evaluate their own proficiency on a number of

given factors, and to get objective measures of the previously rated proficiency areas through a battery of tests. Through this material proficiency could be compared with background information in order to look at which background factors most influenced proficiency for the given factors.

Several studies looking at proficiency in relation to background profiling and self-evaluation have been conducted earlier (e.g. Bahrick, Hall, Goggin, Bahrick, & Berger, 1994; Delgado, Guerrero, Goggin & Ellis, 1999; Flege, Yeni-Komishian & Liu, 1999; Jia, Aaronson & Wu, 2002; Vaid & Menon, 2000), but these have mainly focussed on proficiency in reading, writing and understanding. The novelty of this project was to include accent proficiency. This was done by self-ratings of participants' awareness of their own degree of foreign accent in their L2 language and how it made them identifiable as L2 speakers of English, as well as the degree to which they have put conscious effort into their own accent. This was later measured against tests of general ability of analysing and manipulating speech sounds.

Participants

37 participants took part in the study, 10 male and 27 female. The participants were largely students, recruited through students' Facebook groups, the university's student-teacher network Fronter, or by promoting the project in lectures and seminars. Participants were informed that they would be rewarded a 200 NOK gift voucher upon completing the test programme. In order to be eligible to participate in the study, participants had to confirm that they were between the ages of 18-35, first language speakers of Norwegian, with no other home language spoken in the family, with the possible exception of English. Participants could not have any diagnosed language or speech impediment, such as dyslexia, stammering, etc., and needed normal or corrected to normal vision and hearing. Participants were also required to have a good level of written and spoken English, although no specifications were given for proficiency in terms of either years of education or academic results.

Table 3 , questionnaire and language proficiency tests

Task	Skill type	Average duration
LEAP-Q	Linguistic profile and self-rating	15 minutes
Sentence reading	Accent rating	2 minutes
YARC	Grapheme to phoneme conversion	3.5 minutes
Spelling	Phoneme to grapheme conversion	4.5 minutes

BPVS3	Vocabulary test	9 minutes
Elision	Sound manipulation	3.5 minutes
Non-word repetition	Phonological memory and reproduction	3.5 minutes
Sentence judgement	Morphosyntactic judgement	4.5 minutes
Gray Silent Reading	Reading comprehension	25 minutes

The first part of study aimed to create a reliable linguistic profile of the participants. For this purpose, an online questionnaire modelled on Marian, Blumenfeld & Kaushanskaya's (2007) Language Experience and Proficiency Questionnaire (LEAP-Q) survey was created. LEAP-Q has been established as a valid and reliable tool that has shown predictable relationships between self-rated proficiency and test performance through testing correlations on a wide range of variables relating to both proficiency, dominance, preference and cultural identification. For the purpose of this study, the LEAP-Q was altered in in a number of ways, the revised version being more extensive in terms of preliminary background information as well as language-specific sections. The background section was introduced by questions on years of formal education and which languages participants received instruction in for each level of schooling. Following the original setup, the revised version went on to cover order of acquisition, perceived dominance, exposure in everyday life, and preference for reading and speaking. Participants were then asked to list cultures with which they identified on a 0-10 scale. These questions included the ratings of dominance and preference as well as cultural identification covered in the original version. The revised version then went on to ask about loss of fluency in any language and at what age this had happened, as well as preference in cognitive situations such as simple mathematics, dreaming, expressing emotions, thinking and talking to yourself. The final question of the background section asked about frequency of language intrusions, whether they were L1 into L2 intrusions or vice versa. All these questions were answered on a 0-10 scale.

Unlike the language-specific sections in the original LEAP-Q (See appendix B), which are identical for each language, sections on Norwegian and English were tailored specifically to include information about accent. The first section on L1 Norwegian included questions on native dialect. These questions covered how strongly regional each participant considered their dialect, how frequently they were identified as a native of their region, how important using their dialect was to them and to which extent they modified their dialect when speaking to someone with a different dialect, all rated on a 0-10 scale. Including these questions on awareness and willingness or ability to modify one's accent was considered relevant in comparison to participants' ability or willingness to consciously

work on improving their degree of foreign accent in English. Participants were also asked questions included from the original LEAP-Q on language exposure in Norwegian-speaking environments, which social and educational factors had contributed to their acquisition of Norwegian and to what degree, as well as current language exposure in social and multimodal settings, e.g. TV, streaming, audio media such as music and podcasts. Participants were then asked to rate their proficiency in speaking, reading, understanding as well as grammar, vocabulary and spelling in Norwegian, on a specified scale from 0- 10.

Similarly, the English-specific section included the same questions on exposure, contributing learning factors and proficiency, as well as age of acquisition and fluency attainment in speaking and reading. The accent focus was introduced by adding questions on spoken variety of English (British/American), as well perceived degree of foreign accent, identification as a foreigner when speaking English, perceived importance of a good accent, and how much effort participants had put into improving their accent. All these four final questions were also rated on a specified scale of 0-10. (See Appendix C for full questionnaire.) Questions for both language sections were updated in terms of both learning situations and exposure, to reflect the importance of new media channels- reading can both be on printed or screen media, streaming media as well as TV, and audio media now also includes podcasts in addition to just music and radio programmes. The original mention of self-instruction through language tapes was also altered to reflect the types of language courses now used. The revised LEAP-Q was set up using Survey Xact, which is an online questionnaire model allowing online distribution through web link. Participants completed the questionnaire independently after having been sent the link.

Proficiency test descriptions

The battery of subsequent tests was made up of 8 individual tasks, described in turn below. Several of the individual tasks were standardised tests formulated for L1 English speakers, including York Assessment of Reading for Comprehension (YARC), British Picture Vocabulary Scale (BPSV3) and Grey Silent Reading Test (GSRT), which were all adapted to bilinguals, many of them specifically revised to reflect differences between Norwegian and English. In addition, several new tests of grammatical judgement and sound awareness were constructed by the research team.

Sentence reading task- accent evaluation

Participants were presented with on-screen instructions that the next screen would show a sentence which they were to memorise. As they pressed a key the screen went blank and they could then

repeat the sentence from memory. The test sentence “The winner of the race won a very large prize and the three losers cursed their bad luck” was composed in order to include a range of phonemes found in English but not Norwegian, such as /θ, ð, dʒ, z, w/, which therefore are known to be challenging to L1 speakers of Norwegian. This task provided a recording of each participant speaking a full sentence, which could then in turn be evaluated for pronunciation and accent. Participants had the opportunity to re-record their answer if they had difficulties reproducing the sentence on first attempt and were informed that number of attempts would not registered as part of their score.

YARC- grapheme to phoneme conversion

The York Assessment of Reading for Comprehension (YARC) is a standardised test developed at the Centre for Reading and Language at the University of York, as a tool of quantifiable assessment of reading and comprehension. The test comprises multiple parts, but for the purposes of this study, a task that focuses on grapheme to phoneme conversion was chosen. Participants were given on-screen instructions that they would be presented with lists of words and that their task was to read through each list as fluently as possible, to only read each word once, and for unknown words just to attempt to pronounce them the way they assumed was correct. Participants were then presented with seven lists of ten words in an increasing level of difficulty, from monosyllabic words in list one to words with up to five syllables in the final list. The lists included entries from all lexical word classes with variable degree of regularity in pronunciation, e.g. *was, strengthen, aggrieved, haemorrhage, bureaucracy.* The administrator entered the number of correctly pronounced words after each list was completed, and the next list was subsequently presented onscreen. This task took an average of 3.5 minutes to complete, and participants were informed that the task was not timed.

Spelling task- phoneme to grapheme conversion.

On-screen instructions were given to listen to words presented auditorily and then to type in the correct spelling of that word using the keyboard. As many attempts as needed could be made before finally validating the spelling using the enter key. Participants heard the word read aloud through their headset, and gave their answer without any feedback. The task had a total of 20 words in total which increased in difficulty in terms of regularity of spelling, e.g. *obtain, pursue, slaughter, fluorescent.* The stimulus material for this task was recorded by a female native speaker of British English and participants could hear each word several times before validating their answer. The task took an average of 4.5 minutes to complete, and participants were informed that the task was not timed.

BPVS3, word understanding task

The BPVS3 test is the third edition of the British Picture Vocabulary Scale, which is one of the most commonly used tests of vocabulary understanding (Dunn & Dunn, 2009). This test, uses recorded words that the participants hear, and then choose which of four accompanying dictionary-type pictures correctly represents the word they just heard. Participants were given on-screen instructions to listen to the words and make their choice using the keyboard. The test had 69 words, ranging from concrete objects and activities (e.g. *reptile, syringe*) to more abstract concepts and technical terminology (e.g. *dilapidated, nutritious*), and the test provides an easily quantifiable overview of the participant's vocabulary. The numbered pictures were presented on-screen as the participant heard the first word, and the next word and accompanying pictures would appear as soon as the answer was given. As in the previous test, recorded stimulus material was read by a female native speaker of British English. The test took about 9 minutes to complete and two breaks were given during the test. Participants were informed that timing was not important.

Elision task

This task was linked more closely to the study's focus on accent, by giving a measure of participants' ability to understand and manipulate sound structures. Through on-screen instructions participants were informed that the task entailed listening to a non-word, and then repeating it. After having done this, they would be asked to repeat it once more, but without one specified sound. The example "Say *sploitel.* Now say *sploitel* without the /l/" was given in the instructions. All non-words were constructed to be phonotactically possible as English words, but without any cognate resemblance to an actual English or Norwegian word. The non-words were either mono- or disyllabic, and the sounds participants were asked to elide could be either in the onset or coda of any syllable. Stimulus material was read by a female native speaker of British English. The task was recorded, and scored by the experiment administrator as either correct or incorrect on first attempt without any feedback to the participant. After each score, the next non-word played automatically. The test had 18 words in total and took about 3.5 minutes to complete. Participants were informed that the task was not timed.

Non-word repetition task

This task was also specifically linked to the study's focus on accent, by testing the participants on a number of factors including phonological memory as well as ability to reproduce unfamiliar sound

and stress sequences. Onscreen instructions were given to listen to a list of non-words presented auditorily, and repeat them. Participants were presented with non-words ranging from one to nine syllables, read by a female native speaker of British English. The non-words were again designed to be phonotactically possible in English, but without any cognate resemblance to English or Norwegian words. Responses were recorded for this task, and scored by the experiment administrator as either correct or incorrect on first attempt, without any feedback. After each score the next non-word played automatically. The task had 22 non-words and took about 3.5 minutes to complete, but participants were told ahead that they would not be timed.

Morpho-syntactic judgement

This task presented participants with English sentences, and they were asked to judge whether each sentence was grammatically correct or not. On-screen instructions were given to look at each sentence and to determine as quickly as possibly whether it was grammatically correct or not, by typing 1 or 0 on the keyboard, corresponding to 'correct' or 'incorrect'. The sentences used in this task were designed specifically to test two major syntactic differences between English and Norwegian. One third of the sentences tested participants on verb placement. Norwegian has verb-second word order (V2 order), in which the finite verb regularly takes second position regardless of being preceded by the subject or another syntactic constituent. English, however, follow SVO word order, in which the verb must be preceded by the subject. 50% of the test sentences were in English with Norwegian word order, resulting in syntactically incorrect sentences like **Tomorrow will the students go on a field trip*. Another third of the sentences tested subject-verbal agreement. In Norwegian, verbs are not conjugated for gender, person or number, so sentences with subjects realised by coordinated noun phrases differing in number(e.g. *the girl with the new shoes*) were constructed. Half the sentences had a verb phrase which correctly agreed with the head of the subject noun phrase ('girl'), as in ('The girl with the new shoes *is* waiting for the bus') and the other half would incorrectly agree with a noun in the postmodifier ('shoes'), as in '*The girl with the new shoes *are* waiting for the bus'. The final third of the sentences were control sentences, of which half were correct, and half had obvious mistakes such as missing words and random word order which could easily be recognised and categorised as incorrect, e.g. **After the party didn't love the people said*. Sentences were presented on at a time on-screen, selected randomly from each category, and the next sentence appeared automatically as an answer was selected. For this task, response times were measured as well as number of correct responses. A total of 32 sentences were given, and participants normally took about 4.5 minutes to complete the task.

Gray Silent Reading test

The final task was a Gray Silent Reading test, which is designed to ascertain reading comprehension through eight short stories of increasing difficulty, with five multiple choice questions accompanying each story. The GSRT (Blalock and Widerholt, 2000) is a standardised test originally intended for first language speakers of English. The questions used test actual understanding by not only asking for answers found explicitly in the texts, but also by asking participants to make judgements and inferences based the information in the texts. Participants were instructed on-screen to read through each story and answer the accompanying multiple-choice questions by pressing the corresponding key. They were also informed that each story would remain on-screen while answering the questions. Each story had four sets of multiple choice questions with four alternatives for each question. Participants pressed a key after having read through a story, which made the first question appear, and a new question would be presented automatically as an answer was given. The eight stories increased in difficulty in terms of length, subject matter and vocabulary. Participants were instructed that they had 25 minutes to complete the task, but that it did not matter whether they finished all the stories, it was more important to be accurate than to be fast. Both percentage of correct answers and number of questions completed were nonetheless measured.

See appendix D for complete test material.

Procedure

After having signed up for the study, participants were sent a link to the questionnaire via e-mail, and were called in for subsequent testing after filling out the questionnaire. Participants were asked to complete the revised LEAP-Q questionnaire prior to testing, so that inclusion criteria could be checked before taking the proficiency tests. Testing took place in the Experimental Linguistics Lab at the University of Agder. Participants were called in individually and given an information sheet and consent form to read through and sign (Appendix A). All tests took place in a soundproofed booth using an Ilyama computer and a Sennheiser GSP 350 headset with microphone. Tests were presented in a continuous sequence using Open Sesame software. The experimenter was seated behind the participant in the booth and started each test after the participant had read the instructions and had any questions relating to the task sufficiently answered. The experimenter used a separate keyboard to score the responses in the tasks requiring oral feedback. The eight parts of the study were performed without any breaks and took on average about 50-55 minutes to complete. After completion of all tasks, participants were given a 200 NOK gift voucher. In order to ensure uniform test conditions and to prime participants for the tests, all communication with participants was in

English.

Results

Participants

37 participants took part in the study, 10 male and 27 female. The average age of participants was 24.7, with a range of 19-35. 2 participants were left-handed and 35 right-handed. All participants were born and resided in Norway. They reported an average of 13.4 years of formal education, and highest level of education was Ph.D. All participants had Norwegian as their first and English as their second language, 19 also had high school level proficiency in at least one other European language. One had experience with Japanese, and one with Norwegian sign language. All participants rated Norwegian and English as their most dominant languages, one rating as English-Norwegian balanced and one as English dominant. In terms of reading preference, 23 listed English as their preferred language, and 14 listed Norwegian. For speaking preference, 28 listed Norwegian, 8 English and one Norwegian sign language. 36 participants listed a primary identification with Norwegian culture, and one listed primary identification with British culture. 7 participants listed a secondary identification with American culture, and 8 with British culture. 25 participants reported having lost fluency in one or more of their languages, where 8 mentioned English and 6 Norwegian, in addition to a number of other languages, mainly German and Spanish. The average age for loss of fluency was 19.5 years, range 15-25. 35 reported that they primarily count and do simple mathematics in Norwegian, one in English and one Norwegian sign language. 30 primarily dreamt in Norwegian, the rest in English, but several reported that this varies. 27 reported to primarily express anger or affection in Norwegian, 7 in English, one in Portuguese and one Norwegian sign language. 24 mainly talked to themselves in Norwegian, 12 in English and one in Norwegian sign language. For both the two last questions a great degree of variance was however reported, where many participants switched between several of their languages.

Table 4, LEAP-Q results

	L1 Norwegian		L2 English	
Question	Mean value	Range	Mean value	Range
Age	24.7	19-35		
Years of formal education	13.4	0-20		

L1 exposure, percentage of time	57.6	25-80		
L2 exposure, percentage of time			38.2	16-70
Rate of mixing languages, 0-10	5.4	0-9		
L2-L1 intrusion	5.8	0-9		
L1-L2 intrusion			2.8	0-9
Months in country	287.5	228-420	6.5	0-36
Months in family	284.3	222-420	14.5	0-253
Months in school/workplace	239.7	148-377	18.8	0-108
Learning contribution- family	9.3	5-10	3.6	0-10
Learning contribution- friends	7.6	3-10	5.4	0-10
Learning contribution- reading	6.8	3-10	7.9	3-10
Learning contribution- school	7.9	1-10	7.6	3-10
Learning contribution- visual media	4.3	0-10	7.7	3-10
Learning contribution- audio media	3.7	0-10	7.4	2-10
Current exposure family	9.4	4-10	2.3	0-8
Current exposure friends	8.5	5-10	5.0	1-10
Current exposure reading	5,5	1-10	8.5	4-10
Current exposure school/ language course/self-instruction	2.1	0-10	6.5	0-10
Current exposure visual media	3.8	1-10	8.4	2-10
Current exposure audio media	3.5	0-10	8.4	4-10
Proficiency speaking	7.2	6-8	6.3	2-8
Proficiency understanding	7.3	6-8	7.2	5-8
Proficiency reading	7.0	3-8	7.0	5-8
Proficiency writing	6.8	3-8	6.1	2-8
Proficiency grammar	6.3	2-8	5.5	2-8
Proficiency vocabulary	6.4	2-8	5.6	2-8
Proficiency spelling	6.4	2-8	5.8	1-8
Proficiency pronunciation			6.0	1-8
Degree of L1 regional dialect	7.5	1-10		
Frequency of regional identification	7.6	0-10		
Importance of L1 regional dialect	6.4	1-9		
Degree of modification of L1 dialect	4.3	1-9		

Age of first acquisition			6.3	3-10
Age of fluency speaking			15.1	9-30
Age of reading			7.7	5-13
Age of fluency reading			13.9	9-18
Degree of L2 foreign accent			3.1	1-9
Frequency of non-native identification			4.7	0-9
Importance of accent			7.0	1-9
Effort with accent			5.7	1-9

Participants reported an almost 60/40 percentage of exposure to Norwegian and English respectively, and most reported an average of time spent in an L1 country that corresponded well with the average age of participants. Somewhat paradoxically the average value given for time spent in an L2 family is more than double the average time spent in an L2 country, however both of these questions had a very wide range of responses. Participants on the whole reported relatively frequent language intrusions, but the frequency of L2 intrusions into L1 was almost double that of the L1 into L2. Other main findings of the Leap-q questionnaire can be grouped into the following categories:

L1 learning contributions

The primary contribution to L1 learning is considered by participants to be family, followed by school and friends, which are rated relatively similar in importance. Reading is listed as contributing significantly less than the primary forms of interaction, followed by visual and audio media. It should be noted that family also has the smallest range in terms of ratings, whereas reading and visual and audio media are rated all the way from “not a contributor” to “most important contributor”.

Current L1 exposure

Participants on average report a high degree of L1 exposure with family and friends, a just over 50% amount of exposure through reading, but a low degree of L1 exposure in visual and audio media. Here again it should be noted that the range here is from “no exposure” to “constant exposure”.

L1 proficiency ratings

Interestingly, no participants rated their L1 proficiency on any level as a 10, and ratings were from a 6.3 to a 7.3 average, understanding being the highest rated and grammar being the lowest rated area of proficiency. Both grammar, spelling and vocabulary had ratings as low as 2, which is interesting in

light of the participants having on the whole high levels of education and no diagnosed language impairments. It seems likely that this is the result of a cultural effect, in both studies performed by Marian et al. (2007), average ratings of L1 proficiency have been much higher, in both instances close to top scores. Norwegian culture is to a large extent influenced by ideas of modesty of own abilities., and this is likely to have influenced the participants.

L1 and accent

Participants reported relatively similar ratings for degree of regional accent and frequency of regional identification. They reported that it was just over moderately important to them to speak in their own dialect and a low degree of dialect modification when speaking to people from other areas. Note however the wide range of response values also in this category, and the fact that some participants have reported virtually no regional dialect and no identification. As Norwegian does not have a standard and non-localised spoken form, this is impossible, and may signify a low degree of awareness of one's own dialect.

L2 acquisition and learning contributions

Age of first L2 acquisition is listed at an average of 6.3 years, and first reading at just over one year later, thereby making the average participant an early bilingual. Age of acquisition is consistent with English being taught in Norwegian schools from first grade at the age of six, and the range (3-10) is also consistent with the fact that English was previously only taught from fourth grade, reflecting the range in participants' age. Attained fluency in speaking and reading is reported at around 13-15 years old on average, however reading before speaking. In terms of most important learning contributors, the image is drastically different to that of L1. Family is reported as having low significance, the most important factor being reading. Learning from visual media is reported as marginally more important than school, and followed closely by audio media, and friends being rated significantly lower than school and media. Of all the possible factors only family and friends were rated as "not a contributor" by some participants.

Current L2 exposure

Consistent with expectations, very low exposure is reported in the family, and an average of half of the time with friends. High exposure is on average reported in terms of reading and all over media exposure, but here again a wide range is seen in responses, from little exposure to constant exposure.

L2 proficiency ratings

L2 proficiency scores varied from 5.5 to 7.2, and again no participants had rated their proficiency on any level at a 10. However, it is interesting to compare ratings on each levels for L1 and L2. For speaking and understanding, scores were very close, with only a 0.1 difference in average rating of L1 and L2 proficiency in understanding. The average proficiency scores for L1 and L2 reading were identical. For other more formal areas of proficiency such as grammar and spelling, L2 ratings were lower than L1 ratings, although not dramatically. Proficiency of pronunciation had an average rating of 6.0. In terms of range, it is worth noting that the lowest L1 reading ratings were 2, whereas the lowest L2 rating for the same question was 5, other than that ranges were similar for L1 and L2 ratings.

L2 and accent

Participants generally rated themselves very highly in terms of accent, with a very low rating for degree of foreign accent, and also a low rating for frequency of identification as a non-native speaker. This may seem slightly contradictory when you compare an average 3.1 rating for foreign accent with an average 6.0 rating for pronunciation. The range for these two values showed reports of virtually no accent and never being identified as a non-native, yet no participants had previously rated their pronunciation proficiency higher than 8. In terms of importance of accent, the average impression is that participants on average view a good accent as relatively important, yet seem to report less of an effort on it than their attitudes of importance might suggest. These final two questions did however have a very wide range of values, where some participants had reported a good accent as “not important” and having made “no effort” on improving it.

Table 5, proficiency test results

Task	Mean score	Range
YARC %	87.7	68.8-100
Spelling %	49.3	15-85
BPVS3 %	74.0	55.1-91.3
Elision %	82.4	61.1-97.2
Nonword repetition %	60.6	27.3-81.9
Morphosyntactic judgement performance %	80.7	68.8-100.0
Morphosyntactic judgement response time ms	30720.5	8607-53461
GSRT correct response %	78.3	58.3-93.8

GSRT number of questions completed	46.5	43-48

Proficiency test results were overall high, spelling being the one test that stands out as the overall lowest area of proficiency, with scores as low as 15%. The YARC test yielded overall the highest average score and was alongside morphosyntactic judgement the only task that saw scores of 100%. The morphosyntactic judgement task also had a huge variance in response time. The highest areas of proficiency from these results were grapheme-phoneme conversion, morphosyntactic judgement and sound structure manipulation. Nonword repetition, which required a combined skillset of both acoustic memory and sound manipulation skills proved challenging to a number of participants, and had a very wide range in scores. Overall, the group seemed to be proficient, but still quite diverse, with significant differences from the lowest to the highest scores on all tasks. This pattern is consistent throughout all tasks, with little noticeable patterns of performance in either more rule-based or more lexical-based proficiencies.

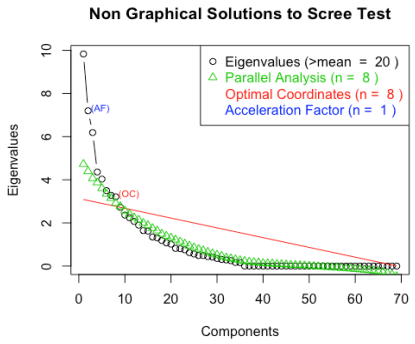
Data removal

One participant had incomplete data, and was removed from the analysis. Percentage of time using L1 correlated highly with percentage of time using L2 (p= -0.87) and was therefore removed from analysis. Age correlated highly with months spent in L2 country and months spent in L1 family (p= 0.93 and 0.72, respectively). A high correlation was also seen between months in L2 country and months in L1 family (p= 0.86). As all three variables shows similar intercorrelations with other variables, only the age variable was retained in the analysis. Rate of language mixing in all languages correlated strongly with both L1-L2 and L2-L1 intrusions (p= 0.91) and was therefore removed from analysis. L1 spelling proficiency correlated highly with L1 grammar proficiency (p= 0.87), but both were retained as they correlated differently with other variables. All other variables had at least one correlation of 0.3 and were included in the analysis.

Factor analysis

After data removal, factor analysis was used to consider statistical clustering of questions, in keeping with the method from Marian, Blumenfeld and Kaushanskaya (2007). 59 potential factors were considered. These factors were then analysed in terms of factor loading and eigenvalues. A factor should have a variable-factor correlation coefficient higher than 0.7 in order to show that the factor extracts a sufficient degree of variance from an individual variable. The final number of factors was eventually accounted for by factor eigenvalues. Factor eigenvalue is a measure of the variance explained by one particular factor, and should be higher than 1 to be considered a separate factor.

Figure 7, components and eigenvalues.



From this material, eight factors were extracted.

Table 6, factors, loadings and variance.

Factor	1	2	3	4	5	6	7	8
SS loadings	5.33	5.27	5.11	4.97	4.76	4.49	3.89	3.45
Proportion variance	0.09	0.09	0.09	0.08	0.08	0.07	0.06	0.06
Cumulative variance	0.09	0.18	0.26	3.34	4.42	0.50	0.56	0.62
Proportion explained	0.14	0.14	0.14	0.13	0.13	0.12	0.10	0.09
Cumulative proportion	0.14	0.28	0.42	0.55	0.68	0.80	0.91	1.00

Factor names were given according to perceived commonalities covered by the variables clustering within each factor. All factors except one had both positive loadings, describing the underlying element described by the factor, as well as negative loadings, indicating an inverse relationship.

Table 7, factor analysis							
Factor 1: L2 text proficiency	*Loading values*	**Factor 2: L1 proficiency through informal exposure**	*Loading values*	**Factor 3: L2 speech proficiency**	*Loading values*	**Factor 4: L1 text proficiency**	*Loading values*
L2 Exposure, reading	0.81	Exposure, friends	0.78	L2 Proficiency, pronunciation	0.82	L1 Proficiency, reading	0.8
L2 Learning, friends	0.77	L2 Exposure, audio media	0.60	L2 Proficiency, speaking	0.75	L1 Proficiency, speaking	0.75
L2 Exposure, friends	0.77	L1 Regional dialect degree	0.59	L2 Proficiency, vocabulary	0.66	L1 Proficiency, writing	0.65
L2 Proficiency, understanding	0.65	L1 Learning, reading	0.52	L2 Exposure, family	0.48	L1 Proficiency, spelling	0.54
L2 Proficiency, writing	0.60	L1 Proficiency, vocabulary	0.50	L2 Proficiency, understanding	0.39	L1 Proficiency, understanding	0.54
L2 Proficiency, reading	0.60	L1 Importance of dialect	0.47	Age	0.39	L1 Proficiency, grammar	0.54
L2 Learning, reading	0.48	L1 Proficiency, spelling	0.47	L2 Proficiency, grammar	0.38	L1 Months in School	0.5
L2 Proficiency, spelling	0.47	L1 Exposure, reading	0.46	L1 Proficiency, vocabulary	0.37	L1 Identification of region	0.47
L2 Proficiency, grammar	0.41	L1 Proficiency, grammar	0.42	L2 Months with family	0.33	L2 Age begin acquiring	0.46
L2 Proficiency, speaking	0.39	L2 Learning, visual media	0.38	L2 Months in country	0.30	Age	0.37
L2 into L1 Intrusions	0.38	L1 Modify dialect	0.36	L1 Importance of dialect	-0.37	L2 Age began reading	0.37
L1 Exposure, family	0.32	L2 Learning, audio media	0.36	L1 Exposure, family	-0.41	L2 Percent Time used	-0.37
L1 Modify dialect	-0.45	L2 Self-perceived accent	0.34	L1 Learning, Family	-0.42	L2 Months with family	-0.63
Age	-0.37	L2 Proficiency, writing	0.31	L2 Frequency identified	-0.65		
		L2 Effort with accent	-0.57	L2 Self-perceived accent	-0.66		
		Years of formal education	-0.51				
		L2 Exposure, school	-0.45				
		L2 Age begin acquiring	-0.35				
		L2 Importance of accent	-0.34				
		L2 Age begin reading	-0.34				
		L2 Frequency identified	-0.33				
Proportion Variance	0.09	Proportion Variance	0.09	Proportion Variance	0.09	Proportion Variance	0.08
Cumulative Variance	0.09	Cumulative Variance	0.18	Cumulative Variance	0.26	Cumulative Variance	0.34
Factor 5: Formal linguistic ability	*Loading values*	**Factor 6: L1 learning**	*Loading values*	**Factor 7: L2 speech learning**	*Loading values*	**Factor 8: L2 age of acquisition**	*Loading values*
L2 Learning, school	0.69	L1 Learning, audio media	0.83	L1 into L2 Intrusions	0.73	L2 Age fluent reading	0.82
L1 Learning, family	0.68	L1 Exposure, audio media	0.80	L2 into L1 Intrusions	0.68	L2 Age fluent speaking	0.75
L1 Learning, friends	0.62	L1 Exposure, visual media	0.77	L2 Learning, family	0.67	L2 Age begin acquiring	0.46
L2 Proficiency, spelling	0.59	L1 Learning, visual media	0.73	L2 Exposure, family	0.58	L2 Age begin reading	0.39
L1 Proficiency, grammar	0.58	L1 Exposure, reading	0.51	L2 Exposure, visual media	0.47	L1 Importance of dialect	0.34
L2 Proficiency, grammar	0.53	L1 Learning, school	0.43	L2 Exposure, audio media	0.46	L2 Importance of accent	0.34
L2 Exposure, school	0.51	L1 Learning, reading	0.42	L2 Percent Time used	0.46	L2 Learning, school	0.33
L2 Months in school/work	0.48	Years of formal education	0.42	L2 importance of accent	0.44	L2 Proficiency, grammar	-0.31
L1 Proficiency, spelling	0.44	L2 Learning, reading	0.36	L2 Learning, audio media	0.43	L1 Learning, school	-0.39
L1 Proficiency, writing	0.43	L2 Learning, visual media	0.34	L2 Learning, visual media	0.35	L1 Proficiency, understanding	-0.49
L1 Exposure, family	0.39	L2 Learning, audio media	0.34	L2 Age began reading	0.32		
L1 Learning, reading	0.37	L1 Modify dialect	-0.4	L2 Proficiency reading	0.32		
L2 Months in country	0.36						
L1 Proficiency, vocabulary	0.35						
L2 Proficiency, writing	0.31						
L2 Age began reading	0.31						
L2 Months with family	-0.4						
Proportion Variance	0.08	Proportion Variance	0.07	Proportion Variance	0.06	Proportion Variance	0.06
Cumulative Variance	0.42	Cumulative Variance	0.50	Cumulative Variance	0.56	Cumulative Variance	0.62

Eight factors were extracted from the data set, with loading values ranging from 0.83 to -0.66. The first factor gave positive loadings for variables that all but one concerned aspects of L2 exposure, learning and proficiency. It included the highest loading for exposure through reading, then in descending order learning and exposure through friends, proficiency in understanding, writing and reading, learning reading, and spelling, grammar and spoken proficiency. The factor also included some low positive loadings for L2 into L1 intrusions and the only L1 variable, exposure in the family. Negative loadings were given for willingness to modify L1 accent and age, indicating that low age reflected higher ratings for amount of exposure through reading and the importance of learning and exposure through friends. The peak loading for exposure through reading and the clustering of positive loadings for proficiency in terms of dimensions relating to reading, writing and understanding suggested this factor as a measure of *L2 text proficiency.*

The second factor was much more varied in terms of clustering variables. The highest loading factor was L1 exposure through friends, followed by L2 exposure through audio media. Most other variables loading onto factor two were related to L1, and included both proficiency in vocabulary, spelling and grammar, but interestingly, also variables concerning L1 regional dialect, including sense of importance of retention, willingness to modify and self-perceived degree of regional dialect. In terms of L1, exposure through reading and learning through reading and tv loaded onto this factor. It is also interesting to consider factors loading negatively onto this factor, as they were more or less all related to L2. Effort with L2 accent, as well as considered importance of L2 accent clustered with school exposure, age of acquisition and age of learning to read in L2. The only non-specific L2 factor loading negatively onto this factor was years of formal education. Considering the age of participants, and the dominance of L1 related variables in this factor, it was understood as a measure of *L1 proficiency through informal exposure.*

The third factor showed clear tendencies in terms of representing almost exclusively variables relating to L2. The three highest loading variables were proficiency in pronunciation, speaking and vocabulary, respectively. L2 understanding and grammar were also represented, as was L1 vocabulary proficiency, the only variable not related to L2. L2 exposure within the family yielded a positive loading, as did age, and finally in positive loadings were months spent in an L2 family and country respectively. It was interesting that the highest negative loading was for L1 importance of dialect, and self- perceived L1 accent was also represented. The other negative loadings were for L1 exposure and learning in the family, and identification as non-native L2 speaker. The clear pattern of clustering variables makes this factor understood as *L2 speech proficiency* measures.

The fourth factor also showed clear patterns, with positive loadings for L1 proficiency in reading, speaking, writing, spelling, understanding and grammar. It was followed by months of L1 taught in school and the ability of other L1 speakers to identify regional dialect, and the other positive loadings were related to age, with weaker positive loadings for L2 age of acquisition and L2 reading age. The only two negative loadings were for percentage of time of L2 use, and months spent in L2 family environment. This factor has, given the clear pattern of clustering, been interpreted as measures of *L1 text proficiency.*

The fifth factor was the most varied, in terms of both languages and variables. The highest loading value (which nonetheless had a lower value than highest value variable in all other factors) was L2 learning in school, followed by L2 learning with family and with friends. Following that, L2 spelling proficiency, L1 and L2 grammar proficiency, and L2 exposure in school, as well as months spent in L2 school or workplace. The subsequent variables were L1 proficiency in spelling and writing, L1 exposure in the family, and L1 learning through reading. Positive loadings were also given for months spent in L2 country, L1 vocabulary proficiency, L2 writing proficiency and first reading. The only negative loading on this factor was months spent in L2 family environment. This factor is somewhat harder to interpret given the distribution of L1 and L2 variables, and fact that the highest loading variables represent both formal and informal learning situations. However, given the fact that several of the clustering variables represent proficiency in grammar, spelling, writing and vocabulary and that variables relating to exposure, learning and time spent show a (slight) leaning towards school- and workplace related settings, this factor has been interpreted as a general measure of *Formal linguistic ability.*

Factor six yielded a smaller number of clustering variables, and also a more uniform pattern. Most variables related to L1, and generally in terms of learning and exposure. The highest positive loading factor was L1 learning through audio media, followed by L1 exposure to audio media. Following that, L1 exposure and learning through watching TV respectively, exposure through reading, learning at school and learning through reading. Years of formal education gave an identical loading value to learning through reading, and three lowest positive loadings represented L2 learning through reading, TV and audio media. The only negative loading for this factor was willingness to modify L1 dialect. This factor is interpreted as a general measure of *L1 learning,* in both formal and informal settings.

Factor seven had its highest loadings for language intrusions in spoken language, L1 into L2, and L2 into L1 respectively. All the other variables were L2 related, including learning in the family, which

yielded a high value, and learning through audio media and TV, yielding significantly lower ratings. Exposure through family, Tv and audio media also clustered here- with exposure values for the two latter rating somewhat higher than the learning values. Other variables were importance of L2 accent, and the two lowest values represented age of reading and reading proficiency. There were no negative loadings for this factor. The high values for speech intrusions, as well as the general pattern of clustering of exposure and learning variables in situations that require perception and processing of spoken language causes this factor to be interpreted as a measure of *L2 speech learning.*

The eighth and final factor extracted also showed a clear pattern in terms of clustering variables. The two highest rating variables were for L2 age of fluency in reading and speaking, followed by L2 age of acquisition and age of reading. A somewhat surprising variable to see here is importance of L1 dialect, but that was followed by importance of L2 accent, and L2 learning in school. Interestingly, the highest negative loading value was for L2 grammar proficiency, indicating a negative relation between that variable and age of reading and speaking fluency. This was followed by L1 learning in school, and L1 proficiency in understanding. Due to the clear pattern of clustering this factor is interpreted as relating to *L2 age of acquisition.*

Further analyses looked at relations between factors and actual proficiency test performance scores. Regression analyses were run for participant scores in each language test against the eight factors and statistical value scores and significance ratings were calculated for factors correlating with each proficiency test. Table 8 shows those factors that yielded significant correlations with participants' test scores

Table eight, factor-proficiency correlations

Test	Statistical value	Significance	Factor
YARC percentage correct	2.24	0.03	Factor 5 Formal linguistic ability
	2.45	0.06	Factor 3 L2 speech proficiency
Spelling percentage correct	1.86	0.07	Factor 5 Formal linguistic ability
	-1.97	0.06	Factor 6 L1 learning
BPVS3 percentage correct	3.33	0.01	Factor 4 L1 text proficiency
	2.52	0.02	Factor 5 Formal linguistic ability
	3.25	0.01	Factor 6 L1 learning
	-1.89	0.07	Factor 8 L2 age of acquisition

Elision	2.09	0.05	Factor 5 Formal linguistic ability
	-2.31	0.03	Factor 8 L2 age of acquisition
Nonword repetition	-	-	-
Morphosyntax reaction time	2.13	0.04	Factor 8 L2 age of acquisition
	-1.90	0.07	Factor 2 L1 proficiency, informal exposure
Morphosyntax percentage correct	1,91	0.07	Factor 5 Formal linguistic ability
GSRT number completed	-	-	-
GSRT percentage correct	2.13	0.04	Factor 4 L1 text proficiency
	1.99	0.05	Factor 3 L2 speech proficiency

Several tests yielded factor correlations consistent with what was expected. A significant positive correlation was seen between YARC scores, indicating grapheme-phoneme conversion proficiency and *Formal linguistic ability,* which included variables such as L2 spelling and writing proficiency, L2 learning and exposure in school, as well as L1 proficiency in spelling and writing. This factor also correlated positively with the spelling test. The spelling test, however, had a negative correlation with *L1 learning*, having high loading values for L1 media exposure and learning, indicating that high ratings for these L1 learning situations and exposure areas were linked to low L2 spelling scores.

The BPVS3 vocabulary test yielded no less than three strong positive correlations, for *L1 text proficiency, Formal linguistic ability* and *L1 learning*, between them covering general areas of L1 and L2 proficiency, as well as both formal and informal exposure and learning situations. A negative correlation to *L2 age of acquisition* is noted, indicating that an early age of acquisition is connected to a higher score in this test.

The strongest positive correlation in the morphosyntactic judgement task was seen in reaction times, correlating strongly with *L2 age of acquisition*, suggesting that early acquisition is linked to shorter response latencies. A negative correlation is seen between response time and *L1 proficiency through informal exposure*, a factor that had high loadings for L1 spelling and vocabulary, but learning and exposure mostly through informal influences such as media and friend, i.e. in situations that might prove more beneficial to less rule-based types of proficiency. It should also be noted the high loadings for L1 regional dialect in this factor, and also the importance of this, perhaps suggesting a connection between the informal influences and perceived importance of nonstandard regional varieties. Values of percentage of correct morphosyntactic judgements also saw a positive

correlation with *Formal linguistic ability*, again relatively consistent with expectations, this factor including high values for both L1 and L2 grammar proficiency.

The same factor was also strongly linked to test scores in the elision task, although not having any loadings for speech-related proficiencies. The elision task also had a strongly negative correlation with *L2 age of acquisition*, indicating higher proficiency of sound manipulation for early learners.

GSRT scores were strongly linked to *L1 text proficiency.* This factor having as its highest loading variable L1 reading proficiency, as well as loadings for understanding, and L2 age of first acquisition and reading was unsurprisingly correlated. Another positive correlation was also found for *L2 speech proficiency*, consistent with this factor's loadings for L2 vocabulary and understanding. No correlations positive or negative were found for neither GSRT number of questions completed nor nonword repetition.

Discussion

The aim of the current research was to investigate the relationship between self-rated accent proficiency, objective language proficiency and bilingual profile. This study added to current research in several ways. We asked bilinguals to rate their L2 language proficiency on a more detailed set of scales relating to different levels linguistic skill including reading, writing, understanding and speaking in addition to spelling, grammar and pronunciation. A specific focus was collecting novel data relevant to accent proficiency and attitudes towards accent in both L1 and L2. We collected objective data from our participants on a series of tasks designed to estimate their actual proficiency at different levels of linguistic skill. Our aims were first to determine how self-rated measures of accent proficiency relate to other measures of language proficiency as well as other aspects of language profile (age of acquisition, nature of language exposure and language use). Secondly, we aimed to determine how self-rated proficiency at different levels of linguistic skill relate to actual measures.

The discussion of the results will focus on the following research questions:
Firstly, how did self-rated accent proficiency relate to other aspects of bilingual profile, that is how did accent variables cluster with other variables from the LEAP-Q questionnaire? Secondly, how did the factors yielded from the study compare to those of Marian et al. (2007), and what may explain any differences? And finally, which correlations were observed between factors and levels of proficiency in test scores?

Looking first at patterns of clustering, ratings of self-perceived accent were primarily found in two factors, *L1 proficiency through informal exposure* and *L2 speech proficiency.* To start with the latter, this factor was consistent with expectations in showing a clustering of most variables related to L2 speech, including proficiency in pronunciation, speaking and vocabulary. The loading values of variables showed a pattern of high ratings for pronunciation proficiency correlating with low ratings for self-perceived accent, they were indeed found on the two outer points of the spectrum. Other related variables in this factor included L2 exposure in the family, as well as months spent in an L2 family and an L2 country. Contrastingly, negative loadings were found for L1 exposure and learning in the family. Also, the age variable was also seen with a positive loading in this factor. This creates an overall impression that a self-reported high proficiency in terms of L2 pronunciation means a low degree of self-perceived accent, primarily linked to somewhat higher age and longer periods of L2 exposure in an L2 environment, abroad or in an L2 family. This is underpinned by the negative ratings for L1 exposure and learning in the family- more L1 exposure in a household setting has the natural consequence of less L2 exposure in a similar setting.

Considering now the other factor, *L1 proficiency through informal exposure,* we see a similar pattern in that this factor includes high L1 exposure through friends. This factor sees a positive loading for L2 self-perceived accent, albeit a low one, and negative loadings for both importance of, and effort with L2 accent. This factor also sees the primary sources of L2 exposure and learning as reading and media, i.e. non-interactive situations. Clustering with this we also see low L2 AoA, and early L2 reading, but the primary impression of the clustering pattern of this factor is that high L1 exposure in situations with friends as well as high exposure and proficiency in L1-reading related variables is linked to high importance of L1 dialect, but low importance of L2 accent, most likely related to a lack of L2 exposure in interactive communicative situations.

Our observed clustering of accent proficiency into the factors discussed above can be related to Flege et al. (1999), who concluded that accent in particular was influenced by variables found in the questionnaire data, referring specifically to L2 use in daily life. The study argues that a natural consequence of more L1 use is less L2 use, and thereby also less knowledge of, among other things, L2 pronunciation. The study is interesting particularly in that it hypothesizes that infrequent L2 use is an effect of poor performance rather than a cause, thereby making it viable that bilinguals who are proficient in L2 reading, but to a greater extent unsure of their oral performance will in fact use their language more in reading- and listening based contexts that don't require oral interaction on their part. This way they are able to use their L2, but are partially inhibited by limitations in usage due to their own uncertainty of abilities and thereby avoidance of communicative interaction. It is also

interesting to note that this factor sees ratings that relate to early L2 acquisition and reading, but nonetheless low degree of accent proficiency, and we might be able to relate this to the different arenas of L2 exposure. Flege et al. do point out that input from native speakers is instrumental to the L2 learner's development of native-like representations and processing, and the importance of language use, not only exposure, is pointed out several times during the article. Similarly, Moyer (2007) mentions that those of her informants who performed best in terms of L2 accent reported not only a great determination and desire to sound "native", but also reported lengthy residence in L2 environment and consistent L2 use among friends in multiple contexts. This means that findings from the present study are consistent with previous research, in that accent is dependent on first and foremost a combination of consistent and lengthy L2 exposure, and interactive and communicative situations as well as a conscious awareness of, and desire to improve L2 accent. Findings suggest a confirmation of a claim by Moyer that L2 experience is "*partly constructed as a response to one's intentions toward the language*" (2007: 514) - if you consider a good accent important and thereby seek out situations that provide feedback and opportunities for improvement, you efforts to improve are more likely to succeed.

In terms of the novel questions added to the questionnaire on accent, they were found to cluster with a number of different other variables. To consider firstly the questions on L1 dialect, a negative loading of -.45 in *L2 text proficiency* suggested that those informants least likely to modify their own L1 dialect were those who rated themselves the most proficient in terms of reading, writing and understanding in L2, and their primary sources of learning were also reading and their friends. No dialect-related variables were however found in the corresponding factor *L1 text proficiency.* Willingness to modify L1 dialect was on the other hand seen to load negatively (p=-.4) onto *L1 learning,* indicating a negative relation to high positive loadings of L1 learning and exposure through audio and visual media. Comparing this to *L1 proficiency through informal exposure,* positive loadings were found for degree of L1 dialect (p=.59), importance of dialect (p=.47) and willingness to modify dialect (p=.36) clustering with factors of L1 exposure and learning through more informal settings and learning situations such as friends and media. These relationships suggest a link between a conscious awareness of one's native regional dialect and willingness to retain it, and a preference for informal learning situations and exposure to situations and media that might bring about more non-standard varieties. Looking at variables relating to L2 accent, these are once again seen to cluster in the *L1 proficiency through informal exposure* factor, only this time negatively. Participants reporting mostly L1 and L2 exposure through audio and visual media, as well as a high degree of awareness and desire to retain their L1 dialect also reported low scores of both self-perceived foreign accent in L2 and effort with accent. This might suggest that L2 learners with more language exposure through

informal sources and media feel more confident with their ability to produce a convincing L2 accent. Indeed, accent related variables were found only to cluster in factors relating to L2 speech proficiency and learning, wherein *L2 speech learning* high loadings for learning and exposure through family (p=.67), visual (p=.47) and audio media (p=.46) clustered with a positive loading for importance of L2 accent (p=.44). Similar patterns were seen in *L2 speech proficiency,* where strongly negative loadings of frequency of identification as a foreigner (p=-.65) and self-perceived foreign accent (p=-.66) clustered again with a high loading for exposure in the family (p=.48), and proficiency in pronunciation (p=.82) and speaking (p=.75). Again, the pattern seems that more informal exposure is seen as beneficial to participants' own perception of their L2 accents, those more exposed to English in informal contexts are more confident with their own accents, and perceive a good accent as more important. Importance of L2 accent is also seen clustering with factors relating to *L2 age of acquisition,* but as a negative loading, suggesting that late starters put less emphasis on the importance of a good accent. Accent and AoA are widely connected in studies on the field (e.g. Flege et al., 1999; Roelofs, 2003; Alario et al., 2010), and the perception is that early acquisition makes for a better accent in that early learners to a lesser extent use L1-set speech parameters to articulate L2 speech sounds. AoA is usually considered to be linked to better proficiency in pronunciation, but has so far not been linked to perceived importance of accent, so this is an interesting correlation to note.

Having considered the two major factors dealing with accent proficiency in this project it seems relevant to relate the factors seen to the factors yielded by the two studies in Marian et al. (2007). Marian et al. conducted two studies using their original LEAP-Q questionnaire, and each study presented a factor analysis with 8 factors, much like the factor analysis for this study. Their factors for study 1 were *L1 competence, Late L2 learning, L2 competence, L1 maintenance, Late L2 immersion, Media-based learning, Non-native status* and *Balanced immersion.* The factors in study 2 were *Relative L1-L2 competence, L1 learning, Late L2 learning, L1 nondominant status, L2 immersion, L1 immersion, L2 nonacculturation* and *Media-based L1 learning.* Comparing those to the factors in this study, it becomes apparent that most of them are quite different. The only factor found in both our material and also in the Marian et al. analysis is the *L1 learning* factor. What becomes apparent in looking at the total set of factors across the three studies, is how the factors extracted are dependent on the group of respondents. The first study conducted by Marian et al. was distributed to a large and diverse group of 52 multilinguals, of which the clear majority spoke three or more languages. Across the group, 34 languages were represented, and the AoA varied from 0 to 15 years. Results from this include factors such as *L1 maintenance, Late L2 learning* and *Late L2 immersion,* indicating that not only did this group include participants who may have grown up, or presently resided in an environment where a language other than their L1 was the primary language, but some

informants may also live in an environment with little L1 stimuli. Comparing study 1 and study 2, which was performed with a more homogenous group of 50 bilinguals with no other languages reported, AoA from 0-23 years, and all participants living in an English language environment, we see that the pattern evens out somewhat. The factors found in their second study focussed primarily on L1 and L2 learning and immersion, the relative competence between the two languages, and also the importance of both media and cultural identification. Interestingly, the factor *L1 nondominant status* is also included, thereby indicating that some participants did not consider themselves L1 dominant, and preferred to use primarily their L2. When comparing the factors across both Marian et al. studies to the ones yielded by this present study, it is evident that our group of participants was much more uniform in terms of both background and present use. Importantly, all the informants had the same native language, they started L2 acquisition more or less around the same time, they did not have other languages spoken in the home, and they all lived in an L1 speaking environment. This led to factors such as language dominance and L1 maintenance not being particularly relevant within the group, the same being said for cultural identification, where few participants felt any significant degree of identification with cultures outside their L1 culture. It is also worth noting the many similarities between the L1 and L2 in question. As previously mentioned, Norwegian and English are closely related, and share a number of similarities both in terms of vocabulary, morphosyntax and phonetics and phonology. Just the fact that all participants were speakers of two closely related languages would contribute to a different analysis than would be the case in a more varied group of bilinguals with first languages from entirely different language groups. The number of shared words both due to common origins and loans are obviously facilitating in terms of both vocabulary and reading comprehension. Also looking at accent, it is apparent from the language comparison section that on the whole, there is not a vast difference between the phonetic inventories of L1 and L2 in this study. The fact that fundamental similarities between the two languages are greater than the differences are probably may also be reasons to why several factors saw clusterings of variables related to both L1 and L2- there is a degree of transfer value that learners can benefit from. In addition, there were no late bilinguals in the group, so although one factor comprised variables related to L2 AoA, late learning or immersion was not relevant within our group. In terms of L1, the main difference was in spoken language, meaning participants' native dialect, which clustered with expected variables more or less throughout. It should also be mentioned that the factor analysis for this study yielded factors with an overall larger number of clustering variables than did the original Marian et al. study. It should nonetheless be noted that AoA consistently turns up as an important variable in several areas of proficiency across a number of studies. As previously mentioned, Marian et al. (2007) claimed a primary link between AoA and phonological proficiency, and the link between these two areas are also confirmed by the findings of Flege et al. (1999), Moyer (2007), Perani

(1998), to name but a few. Other studies, on the other hand (reviewed in Birdsong 2005) have linked early AoA to morphosyntactic proficiency, and Flege et al. (1999) states that it seems likely that a critical period for morphosyntax may exist. It is interesting to note that the clustering of variables in the factors of this study suggests that both accent and grammatical proficiency may be linked to AoA. The *L2 age of acquisition* factor indicated that high degree of grammar proficiency is linked to low AoA, similarly *L2 speech proficiency* links all three variables, age, grammar proficiency and foreign accent, indicating that low AoA is linked to proficiency in both areas. This is congruent with previous research on AoA and accent, as well as linking it to research on AoA and rule-based types of proficiency.

Another important point for discussion is whether accent proficiency predicted any aspects of the objective test results. We had predicted a correlation between speech-related tests such as elision and nonword repetition and reported accent proficiency, but we did not observe these effects. As shown in table 8, observed correlations in the elision task were strong for both *Formal linguistic ability* and *L2 age of acquisition,* but both of these factors have remarkably few accent-related variables. The former factor has no clustering speech-related variables for neither L1 nor L2, and the latter only the variables for importance of L1 dialect and L2 accent respectively, but no variables related to actual speech or pronunciation proficiency, or self-related variables related to participants' perception of their L2 accent. A high (p=.75) loading for L2 fluency in speaking is nonetheless seen, but it seems that performance in the elision task is not predicted by self-ratings in speech-related variables. Similarly, the nonword repetition task had no correlations to any factors whatsoever. This is an interesting point in that preliminary assumptions were that accent proficiency would be linked to performance tests focussing on the ability to understand, manipulate and reproduce sound structures, all being instrumental in actually being able to speak in any other language or accent. The learner must process and understand auditive stimuli, and then reproduce sound structures which to a smaller or greater extent can be phonotactically distant from L1 speech. This would make it a natural assumption that participants who reported good accents and having made an effort with their accent would perform better in tasks relating to speech reproduction, although results did not reflect this. Munro and Derwing (1995) observed correlations between number of grammatical errors and both number of phonetic and phonemic errors, and correlation between phonemic errors and intonation errors, and concluded that mistakes in one area tend to entail mistakes in others. However, they noted a surprising lack of correlation between both phonetic and phonemic errors, as well as between phonetic errors and intonation, and therefore concluded that these categories were separate from each other. The lack of correlations between speech-related factors and sound

manipulation tasks in the present study may suggest that this view is correct- proficiency in one area of sound manipulation does not necessarily entail similar proficiency in others.

It should perhaps be noted, however, that the stimulus material for these two tasks was read by a British English speaker, and several participants reported speaking with an American accent. This might have led to confusion especially in participants who had a very clearly defined accent, and regarded themselves as particularly proficient in that accent- repeating sound structures with British patterns of pronunciation might have thrown some off, or errors could be made due to failed attempts to appropriate the stimulus nonwords to their own pronunciation. Future research should therefor consider separate stimulus material adapted to participants' reported accents, read by both British and American speakers.

One speech-related test that did have a positive correlation to the *L2 speech proficiency* factor, was the YARC test, although this correlation was borderline, and secondary to a much stronger correlation again to *Formal linguistic ability.* This factor, with its clustering variables of positive loadings for proficiency in pronunciation and vocabulary, and strongly negative (p=-.65-66) loadings for frequency of identification and self-perceived accent seems a likely correlation to the word reading task, in that it combined both knowledge of vocabulary and pronunciation. It should however be noted that more than just reading comprehension, the YARC test is also a measure of both vocabulary and pronunciation. As mentioned previously in the Language Comparison section, Wimmer and Goswami (1994) suggest that English to a much greater degree than many other languages requires a direct lexical approach in phoneme-grapheme conversion. Since English spelling is considered to a great extent to be unpredictable, and phoneme-grapheme code is consequently often opaque, one might argue that a test requiring reading lists of unfamiliar words is possibly a better measure of the knowledge of the actual words and their pronunciation, rather than the participant's ability to convert graphemes to phonemes, and thereby not an accurate measure of general pronunciation. Somewhat surprisingly, a strong positive correlation between *L2 speech proficiency* and the GSRT was also observed. However, due to the high positive loadings for proficiency in L2 understanding, vocabulary and grammar seen clustering in this factor, one might see some relation. However, the two factors *L1 and L2 text proficiency* would have been more expected predictors than a more purely speech-related correlation.

One factor that does in no less than three instances prove to have strong correlations with test performance is *L2 age of acquisition.* In considering the pattern of clustering, one particular point of interest has been the link between proficiency and age of acquisition. This factor saw loading values

of p=.46 for L2 AoA and p=.39 for L2 age began reading offset values of p=-.31 for L2 grammar proficiency and p=-.49 for L1 proficiency in understanding , thereby suggesting a link between early acquisition and reading and these two proficiencies- the earlier you start, the more likely you are to feel that you master them. L2 AoA also clustered in the factor *L2 speech learning*, in which a p=.32 loading value for age of first reading was observed, but was also found in L1 specific factors. *L1 text proficiency* had a p=.46 loading value for L2 AoA, and a p=.37 loading for first L2 reading. Also the factor *Formal linguistic ability* saw a p=.31 loading for L2 age of first reading, thereby indicating that age of acquisition is specifically important to the more rule-based types of language proficiencies, which was reflected in all factors by the cooccurrence of low values for AoA and first L2 reading, and high loadings for rule-based proficiencies such as grammar and spelling. This is reflected in the strong correlation seen between *L2 age of acquisition* and performance on morphosyntax response time. The significant influence on this factor on performance in this task seems to support findings that link early acquisition with proficiency in rule-based grammatical competence. This includes Perani et al. (1998) and Flege et al. (1999), however Marian et al. observed the strongest link between AoA and phonological competence, and only secondary links to AoA and rule-based competence. Further correlations were however seen between AoA and performance in both BPVS3 and Elision tasks, which seem likely relations to early reading and speaking fluency.

Although the objective of this study has not been to perform any direct comparison of self-rated proficiency variables and test performance, it might be a point for future studies to consider that the LEAP-Q asks for ratings for very general qualities, some of which are more easily understood and quantified by participants than others. One might argue that it is easier to be aware of one's own proficiency in spelling than in a quality simply called "understanding", which can be interpreted as understanding speech or understanding written language. Similarly, "speaking" is made up of a combined skillset, which to a larger or smaller extent can be mutually dependent- a participant may have good pronunciation, but give a low rating for "speaking" because (s)he feels uncertain about having the required vocabulary or indeed producing grammatically correct sentences in a speech situation. Proficiency in "grammar" can also feel elusive to participants in that it may be hard to interpret the actual demands of being grammatically proficient- does it suffice to recognize a grammatically correct or incorrect sentence, or do participants feel that they need to be able to account for grammatical principles in order to be grammatically proficient? Marian et al. (2007) used a battery of tests that included reading fluency and comprehension tests that required participants to read sentences or passages and declare them true or false and supply missing words. They also used more productive speech-directed tests in which participants listened to passages and supplied missing words. One might argue that the more specifically directed at a single variable rating a test

gets, the more it gets removed from a context of actual language use. Another point regarding test design is that as mentioned, sound stimuli were only provided with British English pronunciation. Ideally, participants should have been able to choose between a British and an American pronunciation stimulus set, as performance may be affected by this. Particularly participants with a strong American accent might in elision and non-word repetition tasks have felt like they had to appropriate the pronunciation they just heard to their own accent and were therefore scored as incorrect. This might also have had an effect in the spelling task, and should be considered for further research.

Looking at the data collected for this study, a major point for further research is objective evaluation of participants' accents. As mentioned, the test battery did include the recording of one sentence designed to reveal typical pronunciation pitfalls for Norwegian speakers of English, but the evaluation of the samples fell outside the scope of this thesis. An accent evaluation was performed in Munro and Derwing (1995), although for the purposes of evaluating accentedness and comprehensibility. Looking at self-perceived accent in light of an objective evaluation of the participants' speech could prove an interesting opportunity for further study.

Conclusion

In conclusion, the results of our study are consistent with previous findings, linking accent to age of acquisition, and further underpinning conclusions from previous studies on accent in emphasizing the connection between L2 exposure in communicative, feedback-allowing settings and a lower degree of foreign accent. Early language acquisition combined with language immersion with native speakers seem to be instrumental to a native-like L2 accent. It is interesting to note that although our participants rated their learning contributions from audio and visual media as much higher than the participants in the original Marian et al. study did - needless to say media use has changed quite a bit since 2007, with an ever increasing exposure to international streaming media from an early age - these forms of language exposure were to a much less degree seen to cluster with speech-related L2 proficiency. Although language exposure through media may be important to language learning, even new media immersion seems not to have altered the impression that actual language *use* in oral, communicative situation, with native L2 speakers is most influential to accent.

Another main finding of the study concerns the question of whether accent proficiency is indicative of performance in other types of tasks. As mentioned, a native-like accent is often seen as the ultimate measure of general L2 proficiency, and is very often the most noticeable feature of having

command of a second language. There is very little evidence to support this in our material. The only significant positive correlation observed for L2 speech proficiency is with reading proficiency, and that is most likely mainly the effect of other variables clustering with accent, such as understanding, vocabulary and grammar. Indeed, even proficiency tests specifically designed to measure speech-related abilities like the ability to remember, manipulate and reproduce viable sound structures gave no correlation to speech-related factors. We may assume that it is likely that an L2 speaker with a convincing accent was an early learner, and through that is relatively proficient also in morphosyntax, as mentioned, Munro and Derwing (1995) also concluded that the number of grammatical mistakes was usually indicative of number of pronunciation-related mistakes. An L2 speaker with a convincing accent has most likely also spent time in an environment of native speakers of the L2, thereby allowing practice with and feedback from native speakers. This means, nonetheless, that to the extent which accent can be predicted, the predictive factors are in the background profile, and not in other areas of L2 proficiency. This is also consistent with the hypothesis from Hulstijn (2011), which claims that knowledge of phonetics, phonology and prosody are basic language cognition faculties, shared by all adult speakers regardless of education or cognitive ability. They are more or less innate knowledge which allows adult speakers to perform at ceiling proficiency level in their L1, but can be an impairment to performance in L2, which is much more dependent on education, which is fundamental to higher language cognition. For this reason, Hulstijn questioned the notion of the "native L2 speaker", and this is consistent with our findings. This leads to the conclusion that accent as a specific type of proficiency is unrelated to most other types of proficiency, it is a separate BLC faculty which is non-predictive of the speaker's other levels of HLC proficiency. Having a convincing L2 accent is therefore not necessarily a sign of a general high level of proficiency, and should for that reason not be considered the most important mark of a proficient L2 speaker.

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Appendixes

Appendix A- Participant information and consent form

Project ELL1

PARTICIPANT INFORMATION SHEET AND CONSENT FORM

INVITATION TO PARTICIPATE IN A RESEARCH PROJECT

THE PROCESSING OF ENGLISH AS A SECOND LANGUAGE

We are looking for Native speakers of Norwegian to take part in a language study investigating the processing of English as a second language.

In order to participate in this study you need to be a **Native speaker** of Norwegian with no other home languages (excluding perhaps English) and have a reasonable proficiency in English as your second language. You should have normal or corrected-to-normal vision and hearing and have no diagnosed language impairments such as dyslexia or stuttering.

The study has three components.

1. A language background questionnaire, which you will be asked to complete on-line and should take no more than 20 minutes.
2. A series of simple language tests which you will be invited to participate in following the completion of the questionnaire. These tests will take approximately 1 hour.
3. An eye-tracking study in which we will measure your eye-movements as you read simple English sentences. This experiment will take approximately 30 minutes.

The principal investigators managing this study at the Experimental Linguistic Laboratory (UiA) are:

Professor Linda Wheeldon (linda.r.wheeldon@uia.no) & Professor Allison Wetterlin (Allison.wetterlin@uia.no)

The studies will be run by 4 Master students at UiA, Kristiansand campus as part of their Master studies:

Bjørn Handeland (bjørn.handeland@uia.no)
Beatrice Zitond Urland (zitonl16@uia.no)
Dag Haugland (dag.haugland@uis.no)
Simon Wigstøl Olesen (simwigol@gmail.com)

Please contact us if you have any queries about the study.

WHAT IS THE STUDY ABOUT?

This study is designed to investigate aspects of the use of English as a second language, in particular, in the use of English by speakers that have Norwegian as their first language. We are interested in how aspects of a bilingual learning and language-use environment relate to different levels of second language English skills. The study has three components.

- An on-line questionnaire asking questions about your language background and about how you rate your own level of proficiency in different aspects of the languages that you speak. It should take about 20 minutes to complete.
- A series of simple language tests that involve short, reading, vocabulary and spelling tests as well as some tasks involving repeating nonsense words. These tests will take approximately 1 hour to complete.
- An eye-tracking study that measures your eye-movements as you silently read simple English sentences. The eye-tracking study is done at the Experimental Linguistics Laboratory at UiA Kristiansand in an eye-tracking booth. During the eye-tracking study you will sit comfortably with your chin on a chin rest and silently read sentences displayed on a computer screen. Your eye-movements will be recorded automatically and at a distance by the eye tracker that uses a harmless beam of infrared light to track the movement of your eyes. Nothing will touch your eyes. This procedure is completely harmless. There are no risks or disadvantages associated with participation in the study.

If, after having read the information below, you decide to take part in the study please complete the consent form below and the questionnaire on this website. Once you have done this you will be contacted by e-mail by one of the researchers listed above. If you are found to be qualified as a participant, we will book times for you to complete the other sections of the experiment. Ideally you would finish all aspects of the study within a week or two of having completed the questionnaire.

The study will collect and record personal information about you. However, all your data will be pooled with that of other participants for statistical analysis and therefor you are essentially anonymous. You will never at any time be mentioned as an individual in relation to this study. Your personal data will be assigned a number code related to your name and stored on a non-networked PC. Only the laboratory directors and experimenters will have access to the key relating your data number to your name.

VOLUNTARY PARTICIPATION AND THE POSSIBLITY TO WITHDRAW CONSENT (OPT-OUT)

Participation in the study is voluntary. If you wish to take part, you will need to sign the declaration of consent on the last page of this document. You can, at any given time and without reason withdraw your consent. If you decide to withdraw participation in the project, you can ask that your test results and personal data be deleted, unless the data and tests have already been analysed or used in scientific publications. If you at a later point, wish to withdraw consent or have questions regarding the project, you can contact the principle investigators managing this project (see e-mail addresses above).

WHAT WILL HAPPEN TO YOUR INFORMATION?

The information that is recorded about you will only be used as described in the purpose of the study. You have the right to access which information is recorded about you and the right to stipulate that any error in the information that is recorded is corrected.

All information will be processed and used without your name or personal identification number, or any other information that is directly identifiable to you.

The principal investigators have the responsibility for the daily operations/running of this research project and that any information about you will be handled in a secure manner. Information about you will be anonymised or deleted a maximum of 5 years after the project has ended.

FINANCE

In appreciation for your time and effort, you will receive a voucher for Kvadraturen for 200 NOK on completion of the three sections of this study. No payment will be received for partial participation.

APPROVAL

The Project has ethics approval from the Norwegian Centre for Research data NSD (ref: 55949 / 3 / STM)

CONSENT FOR PARTICIPATING IN THE RESEARCH PROJECT

I AM WILLING TO PARTICIPATE IN THE RESEARCH PROJECT

TITLE: THE PROCESSING OF ENGLISH AS A SECOND LANGUAGE

1) I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2) I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. I understand that I can withdraw my data at any time during the experiment and after completion of the study until the data is analysed.
3) I understand that data collected during the study will be looked at by researchers from the University of Agder. I give permission for these individuals to have access to my data. I understand that my data will be stored anonymously.
4) I agree to take part in the study.

---

date

Participant's Signature

Participant's Name (in BLOCK LETTERS)

Appendix B- Language Experience and Proficiency Questionaire (LEAP-Q)

Northwestern Bilingualism & Psycholinguistics Research Laboratory

Please cite Marian, Blumenfeld, & Kaushanskaya (2007). The Language Experience and Proficiency Questionnaire (LEAP-Q): Assessing language profiles in bilinguals and multilinguals. *Journal of Speech Language and Hearing Research, 50* (4), 940-967.

Language Experience and Proficiency Questionnaire (LEAP-Q)

Last Name		First Name		Today's Date	
Age		Date of Birth		Male ☐	Female ☐

(1) Please list all the languages you know **in order of dominance**:

1	2	3	4	5

(2) Please list all the languages you know **in order of acquisition** (your native language first):

1	2	3	4	5

(3) Please list what percentage of the time you are *currently* and *on average* exposed to each language.
(*Your percentages should add up to 100%*):

List language here:					
List percentage here:					

(4) When choosing to read a text available in all your languages, in what percentage of cases would you choose to read it in each of your languages? Assume that the original was written in another language, which is unknown to you.
(*Your percentages should add up to 100%*):

List language here					
List percentage here:					

(5) When choosing a language to speak with a person who is equally fluent in all your languages, what percentage of time would you choose to speak each language? Please report percent of total time.
(*Your percentages should add up to 100%*):

List language here					
List percentage here:					

(6) Please name the cultures with which you identify. On a scale from zero to ten, please rate the extent to which you identify with each culture. (Examples of possible cultures include US-American, Chinese, Jewish-Orthodox, etc):

List cultures here					
	(click here for scale	(click here for scale	(click here for scale	(click here for scale	(click here for scale

(7) How many years of formal education do you have? _____ _____
Please check your highest education level (or the approximate US equivalent to a degree obtained in another country):

☐ Less than High School ☐ Some College ☐ Masters
☐ High School ☐ College ☐ Ph.D./M.D./J.D.
☐ Professional Training ☐ Some Graduate School ☐ Other:

(8) Date of immigration to the USA, if applicable ___ _____
If you have ever immigrated to another country, please provide name of country and date of immigration here.
_____ _____

(9) Have you ever had a vision problem ☐, hearing impairment ☐, language disability ☐, or learning disability ☐ ? (Check all applicable). If yes, please explain (including any corrections):
_____ _____

Language:

This is my (please select from pull-down menu) language.

All questions below refer to your knowledge of .

(1) Age when you…:

began acquiring :	*became fluent* in :	*began reading* in :	*became fluent reading* in :

(2) Please list the number of years and months you spent in each language environment:

	Years	Months
A country where is spoken		
A family where is spoken		
A school and/or working environment where is spoken		

(3) On a scale from zero to ten, please select your *level of* ***proficiency*** in speaking, understanding, and reading from the scroll-down menus:

Speaking	(click here for scale	Understanding spoken language	(click here for scale)	Reading	(click here for scale

(4) On a scale from zero to ten, please select how much the following factors contributed to you learning :

Interacting with friends	(click here for pull-down scale)	Language tapes/self instruction	(click here for pull-down scale
Interacting with family	(click here for pull-down scale)	Watching TV	(click here for pull-down scale
Reading	(click here for pull-down scale)	Listening to the radio	(click here for pull-down scale

(5) Please rate to what extent you are currently exposed to in the following contexts:

Interacting with friends	(click here for pull-down scale)	Listening to radio/music	(click here for pull-down scale
Interacting with family	(click here for pull-down scale)	Reading	(click here for pull-down scale
Watching TV	(click here for pull-down scale)	Language-lab/self-instruction	(click here for pull-down scale

(6) In your perception, how much of a foreign accent do you have in ?

(click here for pull-down scale)

(7) Please rate how frequently others identify you as a non-native speaker based on your accent in :

(click here for pull-down scale)

Language:

This is my (please select from pull-down menu) language.

All questions below refer to your knowledge of .

(1) Age when you…:

began acquiring :	*became fluent* in :	*began reading* in :	*became fluent reading* in :

(2) Please list the number of years and months you spent in each language environment:

	Years	Months
A country where is spoken		
A family where is spoken		
A school and/or working environment where is spoken		

(3) On a scale from zero to ten please select your *level of **proficiency*** in speaking, understanding, and reading from the scroll-down menus:

Speaking	(click here for scale)	Understanding spoken language	(click here for scale)	Reading	(click here for scale

(4) On a scale from zero to ten, please select how much the following factors contributed to you learning :

Interacting with friends	(click here for pull-down scale)	Language tapes/self instruction	(click here for pull-down scale
Interacting with family	(click here for pull-down scale)	Watching TV	(click here for pull-down scale
Reading	(click here for pull-down scale)	Listening to the radio	(click here for pull-down scale

(5) Please rate to what extent you are currently exposed to in the following contexts:

Interacting with friends	(click here for pull-down scale)	Listening to radio/music	(click here for pull-down scale
Interacting with family	(click here for pull-down scale)	Reading	(click here for pull-down scale
Watching TV	(click here for pull-down scale)	Language-lab/self-instruction	(click here for pull-down scale

(6) In your perception, how much of a foreign accent do you have in ?

(click here for pull-down scale)

(7) Please rate how frequently others identify you as a non-native speaker based on your accent in :

(click here for pull-down scale)

Appendix C- LEAP-Q revised version

Language experience questionnaire

INCLUSION CRITERIA

Inclusion criteria:

Are you a native speaker of Norwegian? YES/NO

Is Norwegian the only language you speak at home (aside from perhaps English)? YES/NO

Are you a reasonably good speaker of English? YES/NO

Do you have normal vision or vision that is corrected to normal with glasses or lenses? YES/NO

Do you have normal or corrected to normal hearing? YES/NO

Can you confirm that you have no language impairments such as dyslexia, stuttering? YES/NO

If you have answered yes to all the above questions, you are eligible to take part in the study.

Section 1

Full name: _____

Age: _____

e-mail address: _____

Date of birth: _____ Male/Female: _____

Handedness: Left /right:_____

Country of birth: _____ Country of residence: _____

1. How many years of formal education do you have? _____

2. What is the highest level of education you have achieved or its approximate equivalent (e.g., high school, Bachelor, Masters, professional training, PhD, M.D. etc.)? _____

3. Please write down the name of the language/s in which you received instruction in school, for each level of schooling:

Primary/Elementary school

Secondary/Middle school

High school

College/University

4. Please list all the languages you have learned in the order you first (learned/acquired) them.

1 2 3 4 5

5. Please list all the languages you can speak in the order of how dominant they are for you.

1 2 3 4 5

6. Please list what percentage of time you are on average exposed to each language (e.g. exposure in terms of talking, listening, and reading, including TV, films, music, etc.) (percentages should add up to 100.)

Language

Percentage of exposure

7. Which language do you prefer to read in? Please list your languages in order of preference for reading.

1 2 3 4 5

8. Which language do you generally prefer to speak in? Please list them in order of preference.

1 2 3 4 5

9. What cultures do you identify with (e.g., Norwegian, British, American, etc.)? Please list the cultures in the box below and then using the scale below from 0 to 10 please rate the extent to which you identify with each culture.

_____

0 1 2 3 4 5 6 7 8 9 10

not moderately totally

at all

List cultures here

Identification rating

10. Do you feel that you have become less fluent in a particular language? YES/NO

If yes, which one? _____ At what age? _____

11. In which language do you usually do the following tasks?

Count, add, multiply, and do simple mathematics

Dream

Express anger or affection

Think or talk to yourself

12. a. When you are speaking, do you ever find yourself accidentally mixing words or sentences from the various languages you know?

_____

0 1 2 3 4 5 6 7 8 9 10

never half of all of

the time the time

b. If yes, how often does English intrude into your Norwegian?

_____

0 1 2 3 4 5 6 7 8 9 10

never half of all of

the time the time

c. And how often does Norwegian intrude into your English?

_____

0 1 2 3 4 5 6 7 8 9 10

never half of all of

the time the time

13. If there is anything else that you feel is interesting or important about your language background or language use, please comment below.

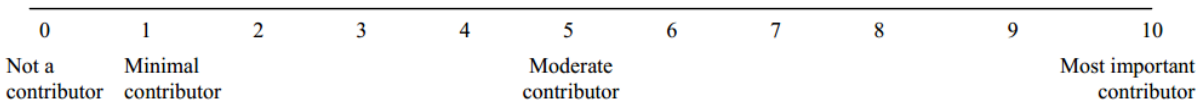
Section 2: All questions below refer to your knowledge of NORWEGIAN

14. Which dialect of Norwegian do you speak? _____

15. Please list the number of years and months you spent in each environment below:

	Years	Months
In a country where Norwegian is spoken		
In a family where Norwegian is spoken		
In a school/work place where this language is spoken		

16. Using the scale below, please indicate how much the following factors contributed to how you learned Norwegian.



Interacting with family	School/education
Interacting with friends	Watching TV/streaming
Reading (e.g.,books, magazines, on-line)	Listening to music, media

17. Using the scale below, please rate to what extent you are currently exposed to Norwegian in the following contexts.

0 1 2 3 4 5 6 7 8 9 10

never half of the time all of the time

Interacting with family	Languages courses/self-instruction

Interacting with friends/colleagues	Watching TV/Streaming
Reading (e.g.,books, magazenes, on-line)	Listening to music, media

18. Using the scale below, please indicate your level of proficiency in speaking, understanding and reading.

0	1	2	3	4	5	6	7	8	9	10
None	Very low	Low	Fair	Slightly less than adequate	Adequate	Slightly more than adequate	Good	Very good	Excellent	Perfect

Speaking	Understanding spoken language	Reading	Writing

19. Using the same scale, please indicate your level of proficiency in Norwegian in the following areas.

Grammar	Vocabulary	Spelling

20. In your perception, how strongly regional is your spoken Norwegian? Please circle a number on the scale below.

_____

0 1 2 3 4 5 6 7 8 9 10

not moderately totally

at all

21. Please rate how frequently others identify which part of Norway you come from when they hear you speaking. Please circle a number on the scale below.

_____

0 1 2 3 4 5 6 7 8 9 10

never half of all of

the time the time

22. How important is speaking in your own dialect for you? Please circle a number on the scale below.

_____
__

0 1 2 3 4 5 6 7 8 9 10

not moderately extremely

at all important important

23. To what extend would you say you modify your own dialect when speaking to a person with a different dialect?

_____
__

0 1 2 3 4 5 6 7 8 9 10

not moderately totally

at all

Section 3: All questions below refer to your knowledge of ENGLISH

Which variety of English do you speak (e.g., British/American)? _____

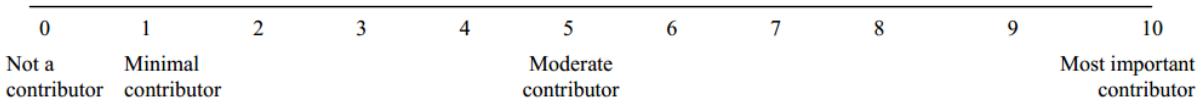
24. To the best of your knowledge, please give the age when you …..

Began acquiring English	Became fluent in speaking English	Started learning to read English	Became fluent in reading English

25. Please list the number of years and months, if any, that you spent in each environment below:

	Years	Months
In a country where English is spoken		
In a family where English is spoken		
In a school/work place where English is spoken		

26. Using the scale below, please indicate how much the following factors contributed to your learning of English.



Interacting with family	Languages courses/self-instruction
Interacting with friends/colleagues	Watching TV/streaming
Reading (e.g.,books, magazenes, on-line)	Listening to music, media

27. Using the scale below, please rate to what extent you are currently exposed to English in the following contexts.

---

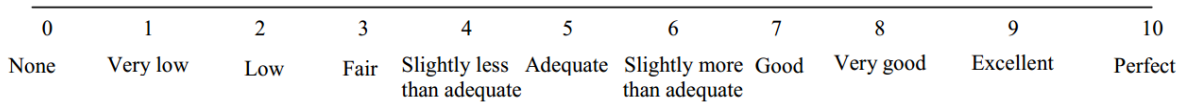
0 1 2 3 4 5 6 7 8 9 10

never half of all of

the time the time

Interacting with family	Languages courses/self-instruction
Interacting with friends/colleagues	Watching TV/Streaming
Reading (e.g.,books, magazenes, on-line)	Listening (music, media)

28. Using the scale below, please indicate your level of proficiency in speaking, understanding and reading English.



Speaking	Understanding spoken language	Reading	Writing

29. Using the same scale, please indicate your level of proficiency in English in the following areas.

Grammar	Vocabulary	Spelling	Pronunciation

30. In your perception, how much of a Norwegian accent do you have when you speak English? Please circle a number on the scale below.

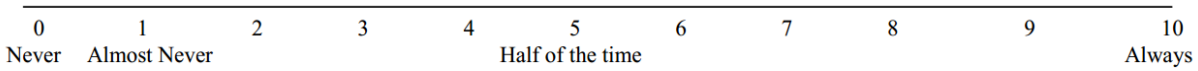
---

0 1 2 3 4 5 6 7 8 9 10

none a moderate extremely

at all accent strong accent

31. Please rate how frequently others identify you as a non-native speaker because of your accent when speaking English. Please circle a number on the scale below.



32. How important it is for you to have a good accent when speaking English?

_____

0 1 2 3 4 5 6 7 8 9 10

not moderately extremely

at all important important

33. How much effort have you put into improving your accent?

_____

0 1 2 3 4 5 6 7 8 9 10

no moderate constant

effort effort effort

at all

Appendix D- Complete set of tests

SENTENCE READING

In a moment you will see a sentence.

Please memorise it so that you can say it fluently.

When you are confident that you know the sentence, please press the space bar to remove the sentence from the screen. Then say the sentence out loud as fluently as you can.

If you need to go back and see the sentence again, please press +.

The winner of the race won a very large prize, and the three losers cursed their bad luck.

WORD READING

When you are ready you will see a list of words.

Please read them all aloud as clearly and fluently as you can.

Read each word once only. If there is a word you don't know or don't know how to pronounce, just give it your best shot and move on to the next one.

Please read the whole list fluently, but it's more important to be correct than to be fast.

There are 7 lists in total.

I will ask you at the end of each list if you are ready to proceed.

List 1: see, look, play, was, like, this, next, house, going, bell

List 2: hang, stand, their, living, again, first, slowly, score, found, bread

List 3: scream, journey, suppose, yawned, should, tissue, caught, stretching, tongue, copies

List 4: medicine, strengthen, source, creative, material, eventually, hygine, despite, calm, journalism

List 5: excitable, dehydration, persuade, aggrieved, originate, courageous, atmospheric, familiarize, scenic, recurrence

List 6: ferocious, cynical, excursion, coincidental, abysmal, endeavor, rheumatism, haemorrhage, liaise, pseudonym

List 7: lacerate, bureaucracy, endogenous, coerce, archaic, facetious, pharmaceutical ochre, fruition, paediatrician

SPELLING

This is a spelling test.

You will hear a spoken word. Please type in the spelling of the word you hear.

If you need to hear the word again before typing please press Enter.

Press Enter when you are happy with your response and the next word will be played.
There are 20 words in total.

Obtain
Vouchers
Parallel
Feasible
Pursue
Disseminate
Caution
Ninetieth
Accommodate
Definite
Thoroughly
Sincerely
Vengeance
Breathe
Leopard
Physicist
Weird
Hypochondriac
Fluorescent
Slaughter

SPOKEN WORD UNDERSTANDING
This task involves matching spoken words to pictures.
You will near a word and see four numbered pictures. Please listen carefully and press the number of the picture that matches the meaning of the word you have heard. It is more important to be accurate than to be fast.
Once you have responded the next word and pictures will appear.
Every few words there will be a pause for you to take a short break.

greeting
antlers

orbit
collision
inflated
applauded
nutritious
adjustable
scalp
reptile
resuscitation
links
arctic
glider
lecturing
engraving
cooperation
fictional
hoisting
isolation
syringe
composing
fern
weary
parallel
dilapidated
departing
easel
embracing
utensil
citrus
digit
feline
pillar
timer
quartet

salutation
agricultural
geriatric
talon
consuming
dwelling
emaciated
lubricating
descending
spherical
exterior
trestle
perforated
cascade
vagrant
trajectory
inoculating
arable
beacon
deciduous
submerging
physician
attire
converging
receptacle
festoon
incarcerating
incline
encumbered
caster
equestrian
convex
culinary

SOUND DROPPING

In this task you will hear a nonsense word and be asked to repeat it.

You will then be asked to say it again without one of its sounds.

For example say blart= BLART.

Now say blart without the l= BART.

Please produce each response once only and speak as clearly as you can.

liːɔgs - iːɔgs

θaʊk - aʊk

ˈzæblət - æblət

twɛln - tɛln

ˈsplɔɪtəl - ˈslɔɪtəl

ˈskreɪpʊs - ˈskeɪpʊs

ˈplaɪ.təf - ˈplaɪ.tə

jaˈluːm - jaˈluː

ˈtræs.dʒɔɪb - ˈtræ.dʒɔɪb

ˈæb.sumpt - ˈæb.supt

klɔːsp - klɔːp

dʒɪlk - dʒɪk

ˈfiːknə - ˈfiːkə

ˈbiːltrʌm - ˈbiːlrʌm

ˈlæn.spʌŋ - ˈlæn.pʌŋ

ˈpɪlp.sɔɪ - ˈpɪp.sɔɪ

ˈrɛmp.slʌf - ˈrɛp.slʌf

ˈwɔɪft.nup - ˈwɔɪf.nup

NONSENSE WORD REPETITION

You will hear a sequence of sounds. Please repeat the sounds as accurately as you can.

The sequences will become increasingly harder.

Please repeat them once only and don’t worry if you make a mistake.

tʃʌz/

/vɜrd/

/slaʊp/

/ˈθrɑːn.tɪb/

/ˈwɛŋ.klɔft/

/ˈdʒɪŋ.prɔɪz/

/sploi.ˈtɛl/

/kɪf.ˈgeɪ.brʌm/

/ˈrɛ.frum.taɪ/

/wɪ.kəˈvuːn/

/ˈtaɪ.ðə.spəˌzɪk/

/ˌkɔ.dʒɪˈtiːθəl/

/faɪˈwɔːk.pəˌtʃɛz/

/ˈrɛt.kɪpˌtaʊˌvum.təm/

/ʃəˈtiːsɑˌbʌnəl/

/ˌmən.laʊˈsiː.oʊˌfrʌpt /

/ˈdʒɑː.bə.ˌrɛm jəˌpluv.zə/

/dʒaɪ.ˈkɛn.tju.əlˌvɪk.ləm/

/ˈvʊk.təl ˌrɔɪ wən ˌɔɪ.sə. ˌsæb/

/fən.ˈstuː. sɪbˌlʌk wəl ˌli.tɪz/

/ˈpaʊ.fə ˌskriːp səˌ strɪkˌmɪl. ti.əs/

/ˈsɪl.vəg. ˈsuːf jə. ˌwæ.spə.nə. triˌtʌm /

SENTENCE JUDGEMENT

This is a sentence judgement task.

You will see a sentence on your screen. Please decide as quickly as you can if it is a grammatically correct English sentence.

Press 1 for correct

Press 0 for wrong

Speed is important for this task, so be as quick and as accurate as you can.

The next sentence will appear automatically, shortly after you respond.

There will be 32 sentences in total and there is no break in this task.

After the party didn´t love the people said.

He played yesterday football the field in.

Our holiday will at home we spend next year.

To the cinema we not want do to go tonight.

She will not go to the show tomorrow night.

Our trip to France has been cancelled due to exams.

Everyone who attended the party said they had fun.

Michael is not going to enjoy the symphony this evening.

Yesterday drank the doctor an expensive wine.

Tomorrow will the students run the long race.

In the afternoon went the class to the park.

When watching the show laughed the audience loudly.

Every day the students go to school on time.

At night the custodians clean up all the empty classrooms.

In two weeks the students will go on a class trip.

Last year Mary took her sister to Disneyland.

The girl with all the heavy bags drink coffee.

The man wearing black shoes walk to the train station.

The collection of documents from the revolution were stolen.

The picture on the labels were too dark.

Mary's cat likes to chase mice in the garden.

The teacher patiently tells the students to be quiet.

Some of the sugar is on the floor under the table.

The actors in the play were learning the script.

The girls waiting for the late bus looks for their ticket.

The children with the toy shovel plays in the sandbox.

Mary and Pat goes to the deli every morning to buy coffee.

The causes of the illness is poor diet and lack of exercise.

A pencil and eraser make writing easier for children.

The tables in the display window look expensive.

Mary's relatives arrive today from the north of England.

The members of the jury have come to a unanimous verdict.

UNDERSTANDING STORIES

Please read each of the 8 following stories and answer the 5 questions for each story.

Press the key (1, 2, 3 or 4) for the right answer (only 1 per question!).

The story will stay on the screen while you answer the questions so you don't have to remember them.

You have 25 minutes for this task. You my not finish all the stories. This does not matter, speed is not important.

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END OF TESTING SESSION

Do you like to see your scores?

Press y for yes and n for no.

END OF TEST

Thank you for your cooperation.