Háskóli Íslands

Hugvísindasvið

Almenn málvísindi

Autism and English in Iceland

Are young Icelanders with autism spectrum disorders using English differently than their peers?

Karen Kristín Ralston

Kt.: 1912692259

Leiðbeinandi: Ásrún Jóhannsdóttir

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Abstract

This triangulation study looks at how young Icelanders with autism spectrum disorders are using English in comparison to their non-autistic peers. This is the first study in Iceland to look at this issue and was set up in two parts. In the first part of the study, 5 parents were interviewed about their children with ASD who claimed to prefer speaking English rather than Icelandic. In these interviews, parents were asked questions about their children's language development, personal interests and how their children use English in their daily lives. The results suggested that new patterns of language development and language usage might be emerging among some young Icelanders with ASD due to English exposure through digital sources and other motivational factors.

In the second part of the study, 9 students with autism spectrum disorders in the age bracket of 13-14 years and 6 students with autism spectrum disorders in the age bracket of 16-17 years, were compared to control groups of age equivalent, non-autistic peers. This comparison was made by measuring these students' receptive lexical vocabulary in English. Also these individuals answered questions in a written survey about where and how often they use English on a weekly basis. The results from the survey revealed only 3 differences in how the students with autism spectrum disorders were using English when compared to their peers. These differences were connected to reading in English and writing in English on YouTube and other social media. The results of the vocabulary tests revealed no significant differences, supporting that young Icelanders with autism spectrum disorders are attaining a level of receptive lexical vocabulary that is similar to their non-autistic, age equivalent peers.

Ágrip

Þessi þríhliða rannsókn með blönduðum aðferðum skoðar hvernig ungir Íslendingar með einhverfu nota ensku í samanburði við jafnaldra þeirra sem eru ekki á einhverfurófinu. Þetta er fyrsta rannsóknin sem gerð er á Íslandi sem tekur þetta efni fyrir og er hún í tveimur hlutum. Í fyrri hlutanum voru tekin viðtöl við fimm foreldra barna með einhverfu sem vildu meina að börnin þeirra kynnu betur við að tala ensku heldur en íslensku. Í þessum viðtölum voru foreldrarnir spurðir um málþroska, áhugamál og hvernig börnin notuðu ensku í þeirra daglega lífi. Niðurstöðurnar gáfu til kynna að ný mynstur í málþroska og málnotkun gætu verið að koma fram á meðal einhverra ungra Íslendinga á einhverfurófinu vegna áhrifa frá tölvutækni og annarra þátta. Í seinni hluta rannsóknarinnar voru níu nemendur með einhverfu á aldrinum 13-14 ára og sex nemendur á aldrinum 16-17 ára bornir saman við samaburðahópa jafnaldra þeirra sem eru ekki á einhverfurófinu. Þessi samanburður var gerður með því að mæla enska ílagsorðaforðakunnáttu þátttakenda. Einnig svöruðu þessir einstaklingar skriflegri könnum um hvar og hversu oft þeir nota ensku í hverri viku. Niðurstöður könnunarinnar voru á þann veg að það eru einungis þrír þættir öðruvísi í notkun nemendanna með einhverfu á ensku miðað við þá sem eru ekki á einhverfurófinu. Þessi munur er tengdur lestri, notkun ensku á YouTube og öðrum samfélagsmiðlum. Niðurstöður orðaforðaprófsins sýndu engan teljandi mun á árangri, sem styður það að ungir Íslendingar með einhverfu hafa sömu ílagsorðaforðaþekkingu og jafnaldrar þeirra sem eru ekki með einhverfu.

Prologue

This is a MA thesis written for the Department of General Linguistics. There are many people who have helped me and contributed to this study in various ways. I want to begin by first thanking the parents and children who participated, and also all the teachers, counselors, therapists, and the Icelandic Autism Society who helped me advertise and find participants for my study. I especially want to thank Brynja Jónsdóttir, Evald Sæmundsen, Jennifer MacNamara and my advisor, Ásrún Jóhannsdóttir, my husband, Olgeir, and other family members. I am very thankful for everyone's patience, help and support. Many of you have contributed to my understanding and concerns regarding this matter. I sincerely hope that this study might begin the process of shedding some light on this important issue in Iceland.

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1. Introduction

Within the Icelandic autism community there is a growing consensus among parents and professionals who report that young Icelanders with autism spectrum disorders (ASD) tend to prefer speaking English rather than Icelandic. These anecdotal reports have described young Icelanders with ASD as having extensive English vocabularies and communicating more effectively in English than in Icelandic. Some reports suggest young Icelanders with ASD use English as an alternative means of communication in nearly all domains. However, this is all anecdotal evidence, and there is no empirical data that confirms any of this information. Due to a lack of studies which focus on this issue, there is a need to carefully look at other studies that focus on how English is used among the general population of Iceland. Thus the intention of this study is to take these observations and examine English usage among young Icelanders with ASD.

Current research in Iceland has found that English is overwhelmingly present in the daily lives of Icelandic citizens as well as in other Nordic nations due to international media, technology, education and travel (Arnbjörnsdóttir 2011; Arnbjörnsdóttir, 2015, Aijmer & Melchers, 2004). In fact, there is a national concern in Iceland about the overwhelming use of English among young people and the negative effects this is having on the Icelandic language (Íslensk málnefnd, 2014; Íslensk málnefnd, 2015; Jóhannsdóttir, 2010; Arnbjörnsdóttir 2015). This study will not directly confront this controversial issue rather the focus will be on providing information which may be relevant to the understanding of how young Icelanders with ASD are using English.

An online news article written by Icelandic speech therapist, Linda Björk Markusdóttir (Markusdóttir, April 2015) expresses concern about English usage in Iceland and the effect it is having on young Icelandic children's language abilities. Markusdóttir reports that a growing number of preschoolers are referred to her for speech evaluations because they are lacking in basic Icelandic vocabulary skills. She describes these children as having no apparent language disorders and growing up in Icelandic homes and attending Icelandic preschools. However, despite being exposed to a predominately Icelandic speaking environment, these children were found to have acquired much of their basic vocabulary in English rather than in Icelandic. This peculiar information may indicate that some Icelandic children are exposed to such an

overwhelming amount of English that they are failing to acquire a sufficient level of Icelandic vocabulary. One might question whether such extreme circumstances can really occur because of passive exposure to English through videogames, watching television programs, and YouTube?

With this question in mind, one might also question whether the reports about the overwhelming use of English among young Icelanders with ASD are unique to autism or is this simply a general trend in Iceland? It would be easy to condemn computers and globalization as the sole culprits in this situation, but there is also a danger of overlooking something and making quick careless assumptions that autism does not play any role in this matter. Therefore, this study will look carefully and consider the role of autism and its effect on communication and language. Because autism affects communication and language (World Health Association, 2015), one might reason that it will also affect how a second language (L2) is used as well as a first language (L1).

The struggle with language and communication among many individuals with ASD is well known (World Health Association, 2015). Therefore, the anecdotal reports about young Icelanders with ASD having extensive English vocabularies is an intriguing prospect to consider. If this study does confirm that Icelanders with ASD are developing extensive English vocabularies, this study will need to ask why. What kind of input have these individuals been exposed to and identify how English is used by these individuals. Are young people with ASD passively listening and reading English or are they actively producing the language through speaking and writing?

Other important issues that are difficult to measure such as personal views, and identity must also be considered. Language, culture, and communication style are reflections of our personal identities (Dörnyei, 2009). Therefore, it is important to consider how people view themselves when considering language choice. We must consider how young people with ASD see themselves in Icelandic society? Inclusion and exclusion may be important issues to consider because these issues may affect both communication style and language choice. If young Icelanders with ASD are choosing to speak English rather than their native language, it is important to look at the connection this has to social and cultural inclusion or lack there of. Another aspect which needs to be examined is what motivates language choice? Thus, personal interests and hobbies that

relate to English such as computer technology and any other activities that are connected to English are pertinent issues to this study.

The study uses a mixed methods approach to look at how young Icelanders are using English, and compares English usage of young Icelanders with ASD with their age equivalent non-autistic peers. The study was conducted in Reykjavik and its outskirts in Iceland in the fall of 2015 and winter of 2016. Interviews were conducted with 5 parents of 7 children with ASD that claimed to prefer speaking English rather than Icelandic. The interviews inquired about language development, how they use English on a daily basis, personal interests, and society's reactions to their child's language choices. Also 9 students with ASD in the age bracket of 13-14 years of age and 6 students with ASD in the age bracket of 16-17 years of age answered survey questions about how they used English on a weekly basis. The results were then compared to control groups of age equivalent non-autistic peers. These same participants also took English vocabulary tests to measure their level of proficiency in receptive English vocabulary. The goal of this study is to use these various methods to analyze how young Icelanders are using English to answer the following questions:

1. Is there a difference in how young Icelanders on the autism spectrum use English in comparison to their non-autistic peers?

2. Do young people on the autism spectrum attain the same level of receptive lexical proficiency in English as their non-autistic peers?

3. If any differences are found between individuals with ASD and their non-autistic peers, what might be potentially causing these differences.

Therefore, there are numerous topics and complex issues, which will be explored in this study. Chapter 2 begins this exploration and provides a framework for the discussion of the study. Thus, the theoretical chapter focuses on multiple issues that relate to ASD and its challenges, communication, and English usage in Iceland. Then chapter 3 consists of descriptions of the research methods and the procedures. This is then followed by a report

of the results in chapter 4 and a discussion of the results in chapter 5. Finally the conclusion of the thesis is presented in chapter 6.

2. Literature review

Language is not only a mode of communication, it is a personal attribute that reflects our individual personalities and the cultures we live in. We learn languages from our environments, and in turn our environment affects the way we speak. In Iceland, as well as in other Nordic countries, people have traditionally spoken their native languages. However, recently English has become much more commonplace in the Nordic countries due to digital technology and globalization. Consequently, the language environment has changed, and such changes affect Nordic citizens (Aijmer & Melchers, 2004). The following chapter will look at these changes, focusing on how Icelanders with ASD might be responding to this new environment, and it will also look at the effects autism has on communication. Thus the following section will need to address multiple issues that relate to both ASD and also the linguistic changes that are occurring in Nordic society.

2.1 English in Nordic Society

The Nordic countries consist of a geographical and a cultural region which includes: Iceland, Finland, and the Scandinavian countries of Norway, Denmark and Sweden. There is a concern in these countries regarding the English language and its tendency to dominate certain domains in Nordic culture. This has led to the implementation of new official Nordic language policies which are designed both to promote multilingualism and simultaneously protect the official Nordic languages. The Nordic Declaration on Language Policy declares four basic linguistic rights of all Nordic citizens:

- to acquire both spoken and written skills in a language essential to society, so that they can participate in the workings of society.
- to acquire an understanding of and skills in a Scandinavian language and an understanding of other Scandinavian languages so that they can take part in the Nordic language community.
- to acquire a language of international importance so that they can take part in the development of world society.

- to preserve and develop their mother tongue and their national minority language (2006, p. 92)

The Declaration of Nordic Language Policy emphasizes that all languages are equal, but they do not have the same role in society. This declaration defines a language as "essential" to society when it is chosen to be used in all official purposes such as in legislation and education, such as Icelandic in Iceland and other Nordic languages in their respective countries. However, the Nordic Declaration on Language Policy also defines a language as "complete" when it has achieved the status of being easily implemented and used whenever desired despite not having an official status.

English does not have an official status in the Nordic countries. Björklund, Björklund and Sjöholm (2013) describe English as the predominant first foreign language in all Nordic countries in their article about multilingual education in Nordic society. Professor of second language studies at the University of Iceland, Birna Arnbjörnsdóttir (2015) writes about the status of English in Iceland stating:

> The extensive use of English needs to be recognized, and its status as an additional language and or utility language in Iceland acknowledged. Further measures need to be taken to actively support Icelandic as the national language of Iceland. (p.216)

Despite English not having any official status, it has been shown to have an overwhelming presence in daily life (Birna Armbjörnsdóttir, 2011; Aijmer & Melchers, 2004) which has sparked many discussions in the academic world dealing with linguistic changes. For example, a special issue of the Nordic Journal of English Studies in 2004 was specifically dedicated to this important new topic. Aijmer and Melchers (2004) introduced this particular issue of the journal writing:

> English has spread into and partly taken over domains such as popular music and entertainment, fashion, sports, advertising and trade. Massive borrowing has taken place on all levels of language. The rise of English has resulted in a concern with issues such as the loss of particular domains and the maintenance and preservation of the domestic language.(p. 1)

Thus English is referred to by some in the academic world as a negative force to be reckoned with.

2.1.1 Nordic attitudes about the use of English

English has not only been branded with negativity by some in the academic world, it has also been shown to provoke controversy among Nordic citizens as found in a study from 2004 by Thøgersen. This study found that the attitudes Nordic citizens had regarding the effects English is having on their languages, were very diverse. Thøgersen suggested that these particular results might indicate that English is affecting the Nordic languages more than anticipated despite the measures of protection taken by The Nordic Declaration on Language Policy. The results from Thøgersen's study in both Norway and Iceland suggest that many citizens are unhappy about the effects English is having on their languages. In addition, this study identified some basic correlations between educational level and attitude towards English influx. This study identified that there is a correlation between English influx and education level where Icelandic citizens with higher education tend to support purist language policies. Such policies have the purpose of keeping the official language free from English influence. This differed from the findings in other Nordic nations where higher education was found to correlate with an openness towards English influx. This data indicates that Icelandic society may be very unique among the Nordic nations regarding attitudes supporting purist language policies.

Icelandic professor from the Department of Lexicography, Gudrún Kvaran (2004) writes that Icelandic language policy has long been known for its purist nature, and that such policies have in the past been successful in maintaining the structure of the Icelandic language. Icelandic has remained structurally almost the same since the Viking Age. One might question what it is about Icelandic culture that has made this possible and whether younger generations of Icelanders will continue the pursuit to keep the language pure despite the high level of exposure to English. Another pertinent question to ask is whether young Icelanders who incorporate English into their daily speech encounter negativity from others that have purist attitudes.

Professor of English from the University of Trondheim, Annjo K. Greenall (2005) points out that research has shown that young Norwegians are more likely to use English influx than older individuals, and describes this tendency as likely to correlate with special interest groups that relate to foreign culture. The possibility that certain groups in society might be more influenced by foreign culture than others seems very logical as

some interests and hobbies have very strong links to English speaking cultures. Naturally this leads to the development of high levels of motivation in some groups to use English as a lingua franca. It is imperative to consider this factor when conducting this study on the usage of English among young Icelanders with ASD. According to Thøgersen such issues have not been studied in much depth, despite evidence of high levels of English usage and English influx (2004).

2.1.2 The spread of English in Iceland

English usage has also been studied in Iceland. In a recent study (Arnbjörnsdóttir, 2011) 750 Icelandic adults were asked about their daily exposure and how they use English. The results from this study confirm that there is a high exposure to English in the daily lives of Icelanders. However, this study also presents evidence that suggests English is typically used passively among Icelandic adults rather than in productive communication. Icelandic adults are listening and reading in English rather than actively speaking the language. This is referred to by linguists as receptive usage of English which indicates that individuals have the ability to understand a language in spoken or written form which differs from productive usage where individuals can both speak and produce a language as well as understand it (Edwards, 2014).

Evidence from recent studies which focus on English abilities and exposure to English among younger groups of Icelanders, suggests that Icelandic children are also exposed to an overwhelming amount of English at very young ages before they officially begin to learn English in primary school. A study of 8 year old Icelandic children, who had not received any formal instruction in English, found that many of these children had already acquired basic skills in spoken English (Lefever, 2010). In another study it was found that 4th and 5th grade students in Iceland have English skills that often exceed the curriculum set up by the National Icelandic Curriculum Guidelines for Education (Torfadóttir, Ragnarsdóttir & Lefever, 2006). Another study conducted a survey where 4th grade students answered questions about where and how they use English. This study found that children claimed to have been exposed to English through their personal interests which involved television, popular music and computers. This study also found that the students' skills tended to exceed the expectations set up for beginners. (Jóhannsdóttir, 2010).

When looking over the Icelandic National Curriculum Guide for compulsory schools (Ministry of Education, Science & Culture, 2015), it becomes apparent that English is the first language taught to all Icelandic primary school children, and Danish is the second foreign language. The National curriculum guide for compulsory schools is not specific about what age English and Danish should be introduced which allows schools a small amount of leeway when choosing their methods and ages for introducing foreign languages (Lefever, 2010). However schools need to begin teaching students English by at least the 4th grade level in order to meet the requirements tested for in the National Achievement examinations. English is recognized as having an important role in the curriculum. The National curriculum guide for compulsory schools is very clear about the role of English and the advantages that come from achieving a high level of English proficiency as stated below:

> English plays a major role in international communication and commerce. The ever growing cooperation and collaboration Iceland has with other countries calls for a substantial knowledge of English that could be crucial in commerce when Iceland's knowledge, industry, position and interests are presented in the international market. As English strengthens its position as a lingua franca, both in the economy and in leisure, the value of solid good command of English becomes more obvious. The world of information and multimedia also demands competence in English. Rapid developments in digital mass communication and information and communication technology gives Iceland access to vast material that requires an understanding of different variations of English. (Ministry of Education, Science and Culture. (2014, p. 129)

The importance of understanding variations of English and becoming proficient in the language is strongly emphasized in Icelandic school policy. English proficiency is a major factor for Icelanders who wish to pursue higher education. This is well illustrated by the number of English textbooks used at the University of Iceland. A study in 2009 calculated that 90% of textbooks at the University of Iceland were in English (Arnbjörnsdóttir & Ingvarsdóttir, 2010). If Icelandic students are lacking in their English skills, they will obviously encounter severe difficulties. Fluency in English is very

important for Icelandic university students placing extreme pressure on these young individuals to achieve high levels of proficiency and fluency in English. A recent study asked Icelandic University students whether they agreed with the statement that they were well prepared to study their respective curriculums in English. The results showed that 32% of students strongly agreed and that they were well prepared for studying the curriculum in English and 44% somewhat agreed with this statement and 19% disagreed somewhat and 5% strongly disagreed. This study also looked at how Icelandic students tend to create coping strategies to help with the demand of learning their curriculum in two languages. The study illustrates that having the text books in English creates more work and pressure for Icelandic students. These young people must simply find ways to cope and become proficient in English (Arnbjörnsdóttir & Ingvarsdóttir, 2010). Thus, one might question what effect these academic demands will have on the use of English in the future, as these young Icelanders mature. As a result, concerns are emerging regarding the future of Icelandic.

In 2014 the Icelandic language committee (Íslensk málnefnd, 2014) published a report that expressed concern in response to the publication of a study called, The Icelandic Language in the Digital Age. This study was published in 2012 (Rögnvaldsson, Jóhannsdóttir, Helgadóttir & Steingrímsson), and it rated Icelandic as second to last in comparison to 30 other European languages which estimated the level of usage of European languages within digital technology. Obviously it is advantageous for Icelanders who wish to use digital technology to be fluent in English due to the extreme lack of Icelandic found in this area. The desire to have access to international media and use digital technology in one's daily life in Iceland are powerful motivational factors that positively influence the use of English as a lingua franca in Iceland.

A recent article called "The Spread of English in Iceland" by Arnbjörnsdóttir (2015) discusses the future of English in Iceland and examines Icelandic research about this issue by comparing the results of numerous new and older studies. As a result, Arnbjörnsdóttir concluded that there are indications that the use of English is still increasing within Icelandic society. These results also indicate that young Icelanders tend to use more English than older Icelanders, and they are also more likely to use English productively than older individuals. This comparative study also identified a different

pattern concerning English proficiency among Icelandic children as compared to adults. The studies reviewed by Arnbjörnsdóttir support that younger Icelandic children tend to be less proficient and use less English than older Icelandic children. This differed from adults where older adults used less English than younger adults. Arnbjörnsdóttir's investigation concluded that there is a necessity for implementing programs that support Icelanders in maintaining their own language. She suggested dubbing children's television programs and increasing the amount of education children receive that is aimed at promoting literacy in Icelandic.

When considering these findings, one might question what type of educational programs would be appealing and appropriate for supporting young Icelanders with ASD in Icelandic literacy development. However, before any such considerations can be made, it is important to look at how autism spectrum disorders (ASD) affect both learning ability and communication.

2.2. Defining the Autism Spectrum

ASD is diagnosed on a spectrum and can affect communication and numerous other abilities. Because there is much diversity among the individuals diagnosed with ASD, defining ASD is very complex. Therefore it is important in this study to be aware of this diversity among the participants and consider both the similarities and differences among the participants with ASD in this study.

Childhood Autism

The first type of autism to be discussed in this section is childhood autism. Childhood autism is perhaps the most well-known of the pervasive development disorders. It manifests in early childhood before the age of 3. The diagnostic criteria for childhood autism are divided into three various categories which include: communication difficulties, difficulties regarding social interaction, and behavior that is stereotyped, restricted, and repetitive. Other behaviors that the World Health Organization names as commonly co-occurring with childhood autism are aggressive conduct, temper tantrums, and difficulties involving eating (World Health Association, 2015).

Atypical Autism

Atypical autism is the second type of autism to be discussed in this section. It is similar in many respects to childhood autism in that it encompasses the same characteristics. However individuals with this diagnosis differ in several respects in comparison to individuals diagnosed with childhood autism. One common difference is that atypical autism does not necessarily manifest before the age of 3. Also the diagnostic criteria of atypical autism varies among individuals. For example individuals with atypical autism may not develop all the characteristics from all three of the categories as is required for a diagnosis of childhood autism. These particular characteristics define childhood autism and include: communication difficulties, difficulties regarding social interaction, and behavior that is stereotyped, restricted, and repetitive. Individuals with atypical autism may often develop characteristics from only two of these three categories. Atypical autism is said to most commonly occur among individuals that have co-occurring learning disabilities (World Health Association, 2015).

Asperger Syndrome

Asperger Syndrome is also considered an autism spectrum disorder. It is associated with learning difficulties in connection to social skills. Such difficulties in social development are found with all autism spectrum disorders. However, Asperger Syndrome differs from the other autism spectrum disorders in the respect that individuals with Asperger Syndrome do not have delayed language or cognitive development (World Health Association, 2015). Never the less, despite Asperger Syndrome not co-occurring with language delays nor language impairment, there are communication difficulties that co-occur with social deficits. Professor of Special Education, author and Asperger researcher, Dr. Gena Barnhill (2001) writes about these communication difficulties found in Asperger Syndrome saying:

> Impairments in verbal communication are observed particularly in the pragmatics or practical use of language, most often difficulty in initiating and sustaining conversation. That is, individuals with Asperger Syndrome use language more as a means to a specific concrete end than as social talk. (p. 261)

The potential advantages of using language in this concrete manner will be further discussed later in this essay.

Pervasive development disorder unspecified

Another type of autism spectrum disorder is Pervasive development disorder (PDD) unspecified. This diagnosis is given when individuals do not fit with the specific characteristics in the descriptions of the other specific autism spectrum disorders, but despite this lack of conformity these individuals have significant autistic traits. Therefore PDD is simply described by the World Health Organization as an unspecific diagnosis of an autism spectrum disorder (World Health Organization, 2015).

Conditions that commonly co-occur with autism spectrum disorders

When looking at the diagnostic criteria of various autism spectrum disorders, it is important to be aware that ASD often co-occurs with other conditions. For example, in a recent large study conducted by Levy et al. (2010) data from 2,558 individuals with ASD were examined. This study identified language disorders as the most common co-occurring condition in autism which was identified with 63% of the participants of this study. Attention Deficit Hyperactivity Disorder (ADHD) was the next most commonly co-occurring condition identified in 21.3% of the cases. Other conditions that were identified as commonly co-occurring were epilepsy, intellectual disabilities, sensory integration disorders and various types of learning disabilities.

Strengths that are associated with autism spectrum disorders

Despite the learning disabilities and various difficulties that autism imposes on individuals, it is also important to define the strengths and giftedness that often accompany autism. Mayes and Calhoun looked at giftedness as well as disability in their study when they measured the IQs of children with ASD at both the preschool and primary school levels (2003). The results indicated that the participants with ASD clearly had many difficulties in connection to verbal comprehension, auditory memory and social reasoning. However, the results also showed a strong tendency for children with autism to have strengths in connection to visual skills such as matching and spatial skills. They

found that approximately half of their participants achieved a standard level of reading, decoding and proficiency in spelling despite many of the participants having low IQs. The participants were measured to have a tendency towards difficulties with reading comprehension, but tended to also perform well in math. Mayes and Calhoun emphasized that interventions and teaching methods that are used with children with ASD should focus on using the visual strengths of these children to compensate for their weaknesses.

Thus it is important to look at these strengths as well as weaknesses in connection to this current study regarding English. One might ask whether Icelanders have developed teaching methods that use visual aids to support Icelandic children with ASD in becoming literate and proficient speakers of Icelandic. Perhaps Icelandic children are receiving more appropriate support in attaining literacy in English through digital technology? Could the access to digital applications and online educational material in English contribute to the affinity for English that young Icelanders with ASD are described to have in anecdotal reports? One might also ask how does the lack of digital material in Icelandic contribute to Icelandic literacy among young individuals with ASD?

2.3 ASD and its effects on language, communication and literacy

Becoming effective communicators is challenging for children with ASD. However, like all other ASD characteristics, communication difficulties are diverse. This diversity is also apparent in genetic research about autism. Studies indicate that there are likely a number of distinct subgroups that make up the autism spectrum (Tager-Flusberg & Joseph, 2003). This extreme diversity among individuals with ASD makes its difficult to address specifically how autism affects language. However, research agrees that there is a strong tendency for autism to co-occur with language disorders (Levy et al. 2010). In this current study it is necessary to define how language disorders that co-occur with ASD affect communication. Tagur-Flusberg and Joseph (2003) identified various types of deficits among individuals with ASD which included: difficulties in vocabulary acquisition, syntax and morphology. They also identified that many individuals tend to have difficulties concerning structural and pragmatic aspects of language. The most profound communication deficit co-occurring with ASD is the diagnosis of being non-verbal. This diagnosis means that individuals say less than five words per day. It is estimated that 14-20% of individuals with ASD fall into this category. Others with ASD

have been described as having a delay in the development of language and begin to talk much later than other children (Rice, Warren & Betz, 2005). This diversity among individuals with ASD in their levels of language proficiency and communication skills is an important issue that must be addressed in this study. Thus it is important to look at language disorders and the patterns of language development that often co-occur with ASD.

2.3.1 Language impairment and autism

Among the groups of children with ASD that are delayed in language development is a sub-group that develops characteristics which closely resemble Specific Language Impairment (SLI) (De Fossé et al., 2004). SLI is characterized by deficits in vocabulary acquisition, morphology, syntax and pragmatics (Rice, Warren & Betz, 2005). Despite the strong similarities that individuals with SLI have with individuals with ASD regarding language difficulties, children with SLI do not have ASD. These children have normal cognitive development in all other areas except language development. Some have speculated about whether SLI and ASD with co-occurring SLI are co-morbid because children with autism so often exhibit the same language difficulties as the children with SLI. Therefore there has been much discussion surrounding this issue. However recent studies which focus on non-word repetition have found significant differences in the performance of children with SLI in non-word repetition tasks in comparison to children with ASD and co-occurring SLI. This finding suggests that SLI with co-occurring autism is a different condition despite its overwhelming similarities to SLI (Williams, Payne & Marshall, 2013).

It is also important to be aware that recent studies have presented evidence for language structure affecting how language impairment manifests within various languages. A recent study conducted by speech pathologist by Elin Thordardóttir (2008) showed that English children with SLI tend to have different difficulties grammatically than Icelandic children with SLI. Here, Icelandic children with SLI tended to have more difficulties in noun phrase morphology in comparison to English speaking children with SLI. Also, the English speaking children with SLI were measured to have more difficulties in verb morphology than the Icelandic children in this study (Thordardóttir, 2008). Even though Elin Thordardóttir's study focuses on SLI rather than co-occurring

autism and SLI, it is important to recognize that language structure may also be a powerful variable that affects language usage among individuals with ASD and co-occurring SLI. While, there is a lack of studies in this area one very small study conducted by Ralston (2013) measured the ability of 3 Icelandic primary school children with autism and co-occurring SLI to identify the gender of Icelandic nouns. The baseline results measured little more than random success in this task, suggesting that the 3 participants had severe difficulties connected to usage of gender in nouns. Perhaps difficulties in connection to Icelandic nouns and noun phrase structure may not be exclusive to Icelandic children with SLI and also may include Icelandic children with autism and co-occurring SLI? Obviously further research is needed to make any reliable conclusions. The fact remains that language structure is a variable that may affect language usage and might even affect language choice among Icelandic individuals with ASD.

2.3.2 Vocabulary ability and ASD

Another important component to look at regarding language proficiency is vocabulary. Children with autism often need support in learning vocabulary, and educational research on autism and vocabulary acquisition has found that individuals with ASD tend to do relatively well in learning simple tasks that involve word identification (Nation, Clarke Wright & Williams, 2006). As a result, numerous teaching interventions for children with ASD that use word identification to teach vocabulary have been developed. For such simple tasks, words are simply paired with their definitions (Mirenda & Iacono, 2009). These learning tasks vary in their degree of difficulty, and the effort that individual words impose on each individual learner is referred to as the learning burden. Words that have familiar patterns tend to have a lighter learning burden than words that have more unfamiliar tendencies (Nation, 2013).

Despite the tendency for individuals with ASD to do relatively well in learning vocabulary through word identification, research also indicates that individuals with ASD tend to struggle with language comprehension (Nation, Clarke Wright & Williams, 2006). This is because language comprehension is a more complex task which is affected by linguistic ability, cognitive ability and social skills (Mirenda and Iacono, 2009). Thus interpreting the meaning of words from actual speech and texts and can pose more

difficulty for those with ASD than simple word recognition. Therefore, the prospect that young Icelanders with ASD may have acquired extensive English vocabularies is an intriguing prospect, but it is obviously necessary to measure their vocabulary in order to confirm such reports.

2.3.3 Literacy development and autism
Language comprehension not only affects vocabulary, it also affects literacy (Mirenda and Iacono, 2009). According to Nation, Clarke, Wright and Williams children with ASD are at a disadvantage regarding literacy development. This is because deficits in language skills put children with ASD at risk in literacy development. Therefore children diagnosed both with ASD and co-occurring SLI are especially at risk. Research also indicates that there is a risk factor for children with ASD regarding impaired reading comprehension. Studies confirm that there is a "strong association" between hyperlexia and autism. However, it is important to refrain from generalizing about children with ASD because there is much variation among individuals regarding linguistic and cognitive skills (Nation, Clarke Wright & Williams, 2006).

In this study reading comprehension might prove to be a significant factor to consider in regards to the results of the written vocabulary tests. The activity of reading influences both vocabulary acquisition and reading comprehension because reading comprehension is dependent upon the ability to process meaning from words. Research indicates that readers readily process new vocabulary while reading when they understand at least 98% of the vocabulary within the text. This ability to acquire new vocabulary dramatically reduces with the percentage of words that a reader understands (Nation, 2013). Thus reading comprehension and vocabulary acquisition might be described as skills that are intimately related.

Another significant factor related to reading comprehension is social skills. Interpreting the social interactions one reads about is important in reading comprehension. For example, difficulties integrating previous knowledge and other forms of social information are common problems among individuals with ASD. This can lead to problems in reading comprehension. Also the social skill of being able to predict what other people feel and think can significantly affect how one interprets a text (Ó Connor & Klein, 2004). This skill is referred to as "theory of mind" in psychology. "Theory of

mind" had originally been defined by Premack and Woodruff in 1978 as "the ability to impute mental states to oneself and to others. This ability to make inferences about what other people believe to be the case in a given situation allow one to predict what other people will do." (Baron-Cohen, Leslie & Frith 1985, p. 39) After the publication of a study in 1985 by Baron-Cohen, Leslie and Frithe (1985) "theory of mind" became strongly associated with ASD. When considering "theory of mind" in connection to reading comprehension, it is clear that this skill of predicting how situations affect the reactions, thoughts and feelings of others can have an impact on how a reader interprets a text. Therefore social impairment is also an important factor in reading comprehension. It affects both cognitive development and language development (White, Keonig & Schill, 2007).

2.3.4 Social skills affect communication style
When looking at social impairment, it is also important to be aware that social skills are a diverse topic, and it is necessary to be specific about what type of social skill one is referring to. At UCLA the connection of social abilities to language and communication has been looked at in a linguistic study conducted by Anthropologist Dr. Elenor Ochs and associates (2004). They differentiate between socio-cultural knowledge and intra-personal knowledge. Intrapersonal knowledge was defined by Ochs and associates as the ability to understand another person's feelings, intentions and knowledge as was also referred to as "theory of mind" by psychologists, Premack and Woodruff (Baron-Cohen, Leslie & Frith, 1985). "Theory of mind" and intra-personal knowledge differ from socio-cultural knowledge which Ochs and associates define as the ability to consider the cultural expectations that a society has for its members.

In a large research project Ochs and associates look at how social cultural knowledge and intra-personal knowledge affect the language abilities of individuals with ASD through the use of conversation analysis. In this study 320 hours of conversation were trans-coded and analyzed (Ochs, Kremer-Sadlik, Sirota & Solomon, 2004). It was found that the participants with ASD were most adept at interpreting other people's conversational sequential moves and were quite adept in transitioning from one conversation turn to another. The participants were also described as responding to questions appropriately in most cases. Their study found evidence for a great deal of

competence in conversational skills that involved consistent, repetitive patterns in language usage. However the participants also demonstrated difficulties regarding what the authors described as "indexicality" which is described by Ochs and associates as the interpretation of the meaning of socio-cultural signs and metaphors. Such signs and metaphors in language require the ability to make inferences in order to interpret social phenomena that is often abstract. The conclusion of the study was that the language among these individuals with ASD had a tendency to lack in symbolic and implied meaning. Their language rather had a tendency to be very direct and goal motivated. With conversation analysis having identified a tendency for the language of individuals with ASD to be a direct and goal motivated style of communication (Ochs, Kremer-Sadlik, Sirota & Solomon, 2004), it is not surprising that others have identified this form of language as advantageous in certain environments.

A study by Davidson (2008) concluded that this direct and to the point style of language is said to be highly effective for online usage. This study points out that online language avoids the confusion of gestures and facial expressions and does not require an immediate response. This gives online conversationalists time to decide on how they wish to react in conversation. These characteristics of online communication may explain the appeal that communicating on the internet has for individuals with ASD. Benford and Standen (2009) and Mazurek (2013) found high levels of usage of various types of online social media among individuals with ASD. The participants with ASD from the studies of both Benford and Standen (2009) and Mazurek (2013) described online communication as more comfortable for individuals with ASD. Participants reported that this form of communicating provided them with more time for deciding on an appropriate social response than in actual conversation. They also described that they experienced socializing online as more controlled and therefore more comfortable and predictable than in actual social settings.

Davidson (2008) describes online autistic culture as having a revolutionary effect on the opportunities for socializing among individuals with ASD. Useful communication is said to be taking place, and adults with autism are said to be finding various types of support online which is leading to self-advocacy. Davidson describes chat rooms and online groups that have been specifically set up to support adults with ASD and that such

websites are said to be supportive and empowering for this group of individuals. They celebrate diversity and help people to see their personal strengths. Issues such as autism diagnosis, self-medication and information about services, social groups etc. have become available online. Davidson describes that such online usage is successfully promoting and supporting the inclusion of people with autism. When considering this information about the internet, it is clear that it can be very positive for many (Davidson, 2008). The internet can have the effect of being socially motivating. For an Icelandic individual with ASD, motivation to use English as a lingua franca and motivation to use the internet are clearly intimately related.

2.3.5 Communication, English exposure and digital technology
Because of the strong relationship between English exposure and the use of digital technology in Iceland, it becomes important to discuss how these topics relate to autism. Recent studies (Mazurek &Wenstrup, 2013; Mazurek& Engelhardt, 2015) have found that both adults and children with ASD have particularly strong interests in digital technology. However this research also indicates that there are some differences in how children with ASD are using digital technology in comparison to adults. This is especially evident in respect to social media usage. Research supports that children with ASD are not using social media which is different than what research reports about adults.

A study by Mazurek and Wenstrup in 2013 found that children with ASD spent 62% more time watching TV and playing video games than their neuro-typical peers. The biggest differences between the children with ASD and their non-autistic peers was in connection to activities that involved social interaction. In addition it was found that the children with ASD spent significantly less time in activities such as reading, homework, sports and time with friends. (Mazurek & Wenstrup, 2013). Thus this time spent watching television and playing video games leads to passively exposing these children to the language environment that these forms of technology emit. It is also important to consider that when children are playing interactive games online, they will likely be using both receptive and productive language skills.

When looking at the research about adults and digital technology, recent research by Mazurek, Engelhardt and Clark found that adults with ASD have high levels of interest for online gaming. However, it was also found that electronic usage of the

internet and other electronic devices used by both children and adults with ASD can be problematic because individuals with ASD have a higher tendency to develop excessive and problematic video game and internet usage. When Mazurek, Engelhardt and Clark asked adult participants with ASD about their motivations for online gaming, the most common reason reported was stress relief. Playing video games and online gaming was described as a method of escaping from everyday life, and some even described it as a way of managing difficulties with mood and anxiety. Online gaming was described by the participants as a way to escape reality and experience a fantasy world. Other participants in this study reported that gaming was a way to fill in time and avoid boredom. Others responded saying that gaming was a way to socialize with others that have similar interests. However it has also been found that the motivation described by these individuals with ASD was not unique to autism. In fact, the motivation that adult individuals with ASD give for online gaming is the very same types of motivation described by non-autistic individuals (Mazurek, Engelhardt & Clark, 2015).

Online gaming and digital technology have become popular in society among many people which includes both people with ASD as well as with non-autistic individuals. Such interests lead to the productive use of language where people are both speaking and writing online. This new motivation to use English for communicating and socializing online is an important aspect to consider in this study.

2.4 Vocabulary research and language usage

The way people use English influences their vocabulary levels. Vocabulary research has shown that proficiency in English requires knowledge of a large number of words (Nation, 2013). In the book, Learning Vocabulary in Another Language (2013), I.S. P. Nation explains how vocabulary tests which are based on word lists according to frequency levels can be used to estimate an individual's vocabulary size. Such wordlists are categorized as high frequency, mid-frequency or low frequency. High frequency words are the words that are most commonly used by native speakers as opposed to low frequency words which are the least common in use. These wordlists have been developed through extensive sampling of English use among native speakers. When looking at the order people learn words in, vocabulary research indicates that high frequency words tend to be learned before words that are less frequently used.

Vocabulary research also indicates that individuals with high levels of language proficiency tend know more words from the lower frequency levels than individuals who are less proficient in English. However, it is also expected that all individuals will know proportionally the most words in the higher frequency categories. Obviously people are most familiar with words that are more common and frequent in use.

Nation estimates that speakers of English need to have acquired receptive knowledge of 3,000 word families to have approximately 95% coverage of the content found in the speech of native speakers, and a receptive knowledge of 7,000 word families is needed for approximately 98% coverage. When considering the vocabulary found in children's movies, research suggests that knowledge of 4,000 word families is needed for 95% coverage and 6,000 word families for 98% coverage. When looking at material that demands more vocabulary knowledge in lower frequency word levels such as newspapers, it has been estimated that readers need knowledge of 4,000 word families for 95% coverage and 8,000 word families for 98% coverage. English novels tend to require even more proficiency with 4,000 word families providing 95% coverage and 9,000 word families with 98% coverage.

In Iceland there is a need to acquire low frequency English vocabulary if one wishes to partake in higher education (Arnbjörnsdóttir & Ingvarsdóttir, 2010). Also English vocabulary knowledge is necessary for Icelanders who wish to have access to digital technology (Rögnvaldsson, Jóhannsdóttir, Helgadóttir & Steingrímsson, 2012). For example, Icelanders who comment in English on social media pages and partake in online gaming need to have sufficient vocabulary knowledge to partake in such activities. Such activities online require the ability to use vocabulary productively. Nation (2013) explains that productive usage of language is more demanding than receptive usage. This is because using language productively requires speakers to have developed both proficiency in output patterns and the ability to interpret meaning. In receptive language, individuals need to be proficient only in interpreting meaning from language patterns. Thus vocabulary tests that measure productive abilities have been shown to be more difficult than receptive tests and reflect a higher level of language proficiency than receptive tests (Nation, 2013).

Thus, such distinctions regarding productive and receptive usage of English are important to consider regarding the methods used to measure vocabulary in this study. It is also important to consider that research supports that children with autism tend to have difficulties with language comprehension (Nation, Clarke Wright & Williams, 2006). This could potentially cause individuals with ASD to be at a disadvantage when vocabulary tests are designed to measure more complex comprehension abilities rather than simply measuring word recognition.

Therefore, motivation to use English productively online might be a factor in creating a positive effect on the vocabulary abilities of individuals with ASD and should be recognized during this study.

2.5 Motivation and L2 Learning

Motivation is a powerful well known determinant in L2 learning (Dörnyei, 1998; Masgoret & Gardner, 2003). When pondering the question of what motivates young Icelanders with ASD in their language choices, it becomes important to look at theories about language choice and the motivation behind such choices.

2.5.1 What motivates language choice and style?

We all make our own personal choices about how we speak in various situations. Ritchie and Bhatia (2014) name 4 factors that are motivational regarding the language choice of individuals who are multilingual. These are:

1. social roles and relationships of participants
2. situational factors: discourse topic and language allocation
3. message-intrinsic considerations
4. language attitudes including social dominance and security (p. 445)

When considering the first factor named by Ritchie and Bhatia about social roles and relationships of conversational participants, it is obvious that there is a mutual need for participants in a conversation to understand one another. Therefore speakers need to find a language preference. If one speaker misinterprets another speaker's capabilities or preferences in language, a mismatch occurs. Such mismatches can lead to ineffective communication. This is a very obvious and a practical factor that influences language choices (Ritchie & Bhatia, 2014). While difficulties with social skills are a hallmark of

ASD (Bohlander, Orlich & Varley, 2012), it is questionable whether individuals with ASD are proficient in this task which is also intimately related to "theory of mind" (Baron-Cohen, Leslie & Frith, 1985). The task of predicting which language a conversational partner prefers might impose communication difficulties for individuals with ASD.

The second factor named by Ritchie and Bhatia (2014) addresses how various situations affect language choice. In multilingual environments there tends to be domains where certain languages and certain styles of language are more suitable than others. For instance, an individual who lives in a multilingual environment might find it socially appropriate to speak one language at home and another at work. One might speak in a casual style with friends and use other more formal forms of language in public or formal situations. Here situations are influencing language choice and language style. One might question again how Icelandic individuals with ASD cope with this task of interpreting what environments are suitable for speaking English and Icelandic or blending English with Icelandic. Again this decision is related to social ability and socio-cultural knowledge**.** This might pose difficulties for individuals with ASD.

Ritchie and Bhatia (2014) also mention that attitudes about language influence language choice. Because there is a tendency for purism regarding the Icelandic language policies (Kvaran, 2004), one might speculate as to what type of reactions Icelanders with ASD might receive, for example when using a language style which maybe considered inappropriate during certain situations. For instance, language which entails English influx or code switching, may be avoided by some Icelanders within formal situations due to socio-cultural norms. However, one might also question whether Icelanders with ASD consider such social factors in their language choices. There is also a possibility that individuals with ASD may feel excluded from mainstream Icelandic society, and therefore might exhibit tendencies to intentionally deviate from the norms in their language choices. Such behavior could potentially function as a method of distancing one's self in certain situations. Deviating from the norm in language behavior could also be related to individual interests and hobbies. Norwegian linguist, Annjo K. Greenall, points out that she believes there is a connection between non-purist attitudes and various sub-groups who have special interests that come from foreign culture such as:

e.g. skateboarding, snowboarding, kiteboarding, rollerblading paintballing, and so on, and typical of most of them is that the terminology which defines the group and the activity that the group gathers around consists of untranslated English loanwords, often in a relatively non-adapted form. (2005, p. 224)

One might question whether young Icelanders with ASD might have a stronger tendency to have special interests that are related to English in comparison to their non-autistic peers. It is also important to emphasize that autism culture is known for its highly motivated usage of the internet and digital technology (Davidson, 2008). Therefore special interests that are connected to digital technology may be some of the most powerful motivational factors to look at in regards to the use of English among young Icelanders with ASD.

2.5.2 Motivational theories in Second Language Research

When discussing motivation it is important to be clear about definitions and the multifaceted nature of this discussion. Therefore it is necessary to address motivational theory in second language research. Professor of psycholinguistics at the University of Nottingham, Zoltán Dörnyei describes the complexity and vastness of the L2 motivation research field as being affected by many variables interwoven with culture and one's identity. He writes:

Motivation to learn an L2 presents a particularly complex and unique situation even within motivation psychology, due to the multifaceted nature and roles of the language itself. Language is at the same time: a communication coding system that can be taught as a school subject; an integral part of the individual's identity; and also the most important channel of community where it is used (Dörnyei, 1998, p. 118).

Because of this complex relationship between language, identity and culture, language is often described as a reflection of who we are and the culture we live in. By studying this intimate relationship between identity, culture, and the languages we speak, one might argue that it is possible to gain new insights into human behavior. When we look at language, culture and identity in connection to this study, it must be asked: how do Icelandic young people with ASD perceive themselves and their own culture? How has autism culture in Iceland been affected by globalization and the use of English as a lingua

franca? Therefore it becomes important to look at L2 motivational theories that might help answer these questions.

2.5.3 The history of L2 motivation research and theory

The history of L2 motivation research began in the mid 20th century when social psychologists, Gardner and Lambert, (1959) proposed a new theory about motivation's role in second language acquisition. Previous to this time it was commonly believed that second language acquisition was almost completely dependent upon linguistic aptitude. Gardner and Lambert proposed that the reasons that L2 learners have for studying a second language are very influential on their achievements and eventual L2 proficiency levels. For instance some learners may desire active roles within another culture and may be seeking job opportunities or friendships in a new society. While others may have more passive goals regarding L2 usage such as simply wanting to acquire the ability to understand simple texts or be able to say basic phrases as a tourist. Gardner and Lambert proposed that such personal goals have significant effects on the amount of effort and in turn the level of achievement that learners attain when studying an L2. As a result, they introduced a new term called integrative orientation or "integrativeness". This term refers to an individual's level of motivation and desire for interaction with members of the L2 culture. They believed that favorable attitudes towards other groups of people outside of one's own culture would lead to high levels of achievement in L2 proficiency. They also proposed that individuals that have unfavorable attitudes towards their own cultures were more likely to have high levels of motivation towards learning an L2 and adopting new norms from foreign cultures. Their theories were among the first to refer to culture and identity as intimately related to L2 acquisition and learning. (Lambert & Gardner, 1959; Dörnyei, 2009).

Since Gardner and Lambert's original publication in social psychology (1959) their theories have been further developed and tested empirically. They have also designed a standardized assessment technique to measure L2 motivation and "integratedness". Their work is often described as highly influential in the field of L2 motivation research, but it has not gone unchallenged. Some have even claimed that their theory has dominated the L2 motivation research field to the extent that it has had a limiting effect on the scope of this field of study. The main criticism regarding their

theory is that it is limited and does not explain motivation to use second languages for other reasons than integrating with native speakers (Dörnyei, 1994; Macintyre, Mackinnon & Clément, 2009).

However, more current research has readdressed the issue of "integrativeness" and confirms again that positive attitudes towards L2 culture and a high level of interest in a foreign culture tends to highly correlate with the level of motivation in L2 learning (Csizér & Dörnyei, 2005). However, despite this current research, the theory of "integrativeness" has become somewhat controversial. It is sometimes described as outdated in globalized society (Macintyre, Mackinnon & Clément, 2009).

Dörnyei points out that in a globalized world the usage of lingua francas have become the norm for more than half of all human populations who are either bilingual or multilingual (2009). This change has resulted in English being less associated with specific English speaking cultures. The desire to learn English no longer necessarily stems from the desire to integrate with a particular English speaking culture and is now often associated with the desire to use English as a lingua franca. (Macintyre, Mackinnon, Clément, 2009). Therefore the changes that came with globalization clearly affect how L2 motivation manifests (Dörnyei, 2009). This may be a factor behind the motivation of many individuals to learn to use English as a lingua franca for the purpose of having access to digital technology and other types of media, as is the case in Iceland.

Dörnyei (2009) therefore suggests that a theoretical framework called "possible selves" may now be a more appropriate description for how L2 motivational learning functions in a global society. "Possible selves" refers to the idea that people envision themselves in various ways. In the case of "the ideal self" an individual envisions what they would like to become concerning hopes, aspirations and accomplishments etc. One also might also envision the self who one does not wish to become and make decisions to avoid becoming this undesirable "possible self". This theory also describes the "ought to be self" which refers to the characteristics one believes one ought to have. This could also be explained as a sense of obligation or a feeling of moral responsibility (Dörnyei 2009; Macintyre, Mackinnon, Clément, 2009). Some L2 researchers emphasize that this new theory of "possible selves" should not replace "integrativeness", but they claim it should

rather expand on the understanding of L2 motivation (Macintyre, Mackinnon & Clément, 2009).

When considering these theories in connection to this current study, one might ask: how do Icelandic young people with ASD see their "ideal self" or "selves"? Do they identify with other Icelanders? Are they proud to be Icelandic? Do they feel like they have been included or excluded in Icelandic society? Do they wish to integrate with other cultures? What potential effects could feelings of inclusion or exclusion in Icelandic society have on how young Icelanders with ASD use English?

2.5.4 Inclusion to literacy

Educational theorists, researchers and authors, Margaret Hawkins and Bonnie Norton (2009) write about inclusion and exclusion in the language classroom. Here it is emphasized that language, texts, teaching methods and learning practices have a tendency to be geared towards certain groups of learners. This can unfortunately lead to some groups of individuals having a linguistic advantage in the classroom and other groups who tend to be minorities or live in poverty, being at a disadvantage in the language classroom. Hawkins and Norton emphasize the importance of critical literacy:

> Characterized by a commitment to reshape literacy education in the interests of marginalized groups of learners, who on the basis of gender, cultural and socioeconomic background have been excluded from access to the discourses and texts of dominant economies and cultures (p.2).

They also emphasize the importance of teacher awareness regarding this inequity and learning how to promote critical awareness in the classroom. This means that equality among cultures, genders and social groups should be actively promoted in schools. They point out that many languages are in danger of disappearing within the next generation. Therefore language teachers need to be aware of this fact and look for opportunities to support multilingualism and multiculturalism by promoting both native languages and L2 usage (Hawkins & Norton, 2009).

Ironically, in Iceland this might also pertain to the native language itself, Icelandic. There has been concern in Iceland about the effects English is having on Icelandic (Íslensk málnefnd, 2014; Íslensk málnefnd, 2015) (e. Icelandic Language Committee, 2014; Icelandic language Committee, 2015). Therefore there may be a need

for educators in Iceland to look for new innovative ways to approach their native language as well as L2s. Educational methods should be designed with the purposes of both maintaining Icelandic culture as well as promoting multilingualism. The language classroom is an ideal place to assist all students while trying to build a positive self-image and pride in their own identities as multilingual, Icelandic citizens. According to Norton (2010), language teachers that use critical awareness as a teaching model, have the goal of teaching both fundamentals skills as well as promoting the value of multiculturalism and diversity. Educators must strive to view things from the perspective of their minority and disadvantaged students.

Norton's views could also pertain to students with ASD. Norton emphasizes that the literacy practices of all students should be approached with a non-judgmental attitude. Providing support for all levels of literacy practices should be one of the most important goals of language teachers (Norton, 2010). Therefore reading materials selected for class must be motivating. One might ask what kind of reading material appeals to young Icelandic individuals with ASD? Are young people with ASD excluded in the language classroom due to educational practices that do not suit them? How may educational practices in Iceland affect the language choices among students with ASD?

2.6 The uncertainty about the use of English among Icelanders with ASD
The language choices among individuals with ASD have been described in reports from both parents and professionals as different from what is believed to be typical in Icelandic society. However, as of yet, little is known about this issue. The fact remains that there is anecdotal evidence from parents and professionals about young Icelanders with ASD who use a great deal of English and have extensive vocabularies. One might ask: Do young Icelanders with ASD simply have high levels of motivation to speak English due to their interests in digital technology and other foreign interests? Is there a connection between high levels of English usage among young Icelanders with ASD and feeling excluded and disgruntled with Icelandic mainstream culture? Does the atmosphere connected to the official purist language policy have an effect on individuals with ASD that might be feeling excluded or disgruntled in Icelandic society? One might also ask whether the structure of English is an easier language for Icelandic individuals with ASD who have difficulties with communication due to language impairment? If this is true, it

maybe that young Icelandic people with ASD who have co-occurring language disorders or language impairment might resort to using English more often than those individuals with ASD who have achieved higher levels of proficiency in Icelandic? The reality is that we do not know anything about this issue, and there is a desperate need to simply take stock of the situation and study this new issue in Icelandic society.

3. The study

3.1 Research Questions

In light of the concerns addressed in the previous chapter, this study investigates how young Icelanders with ASD use English. It asks the question of whether young people with ASD use English differently from their peers. The study was set up in two parts using mixed methods to look at these issues from various perspectives and to investigate the following research questions:

1. Is there a difference in how young Icelanders on the autism spectrum use English in comparison to their non-autistic peers?

2. Do young people on the autism spectrum attain the same level of receptive lexical proficiency in English as their non-autistic peers?

3. If any differences are found between individuals with ASD and non-autistic individuals, what could potentially be causing these differences?

3.2 Methodology

Part 1

In part 1 of this study, 5 parents were interviewed. There were 7 children with ASD in total. These particular children were described by their parents as preferring to speak English rather than Icelandic. The purpose of these interviews was to document the views of the parents and also look for possible traits and patterns of language development that these children might have in common.

Part 2

The second part of the study was a comparative study. Here English usage among Icelandic students with ASD and their peers ages 13-14 and 16-17 years was investigated. A survey was used to ask questions about where and how often they use English. Also the participants took 2 types of written vocabulary tests to measure and compare their proficiency in English lexical vocabulary.

3.2.1 Participants

Part 1A

The participants consisted of 5 parents who were interviewed about their children with ASD whom they described as preferring to communicate in English rather than in their native Icelandic language. Two of these 5 parents had 2 children with ASD that were described as having strong preferences for English. Therefore these 2 parents were interviewed about both of their children. Four of the participants were found through an advertisement with the Icelandic Autism Society. The other participant was found through information given to the author from a school in the Reykjavik area. All of the parents were selected for these interviews because they described their children with ASD as preferring to speak English rather than Icelandic. There were no age restrictions used when selecting the participants due to a lack of empirical evidence surrounding this issue. Therefore it was unknown whether there were any specific age groups of children with ASD that had strong tendencies for using English in Icelandic environments. Therefore one of the goals when conducting these interviews, was to determine whether there were any tendencies regarding age in connection to preferring English.

Information about the children discussed in the interviews is shown in table 1. This information includes the number of children discussed in each interview, gender, ASD diagnosis and the level of school each child attends or the individual's work status. The exact ages of these children with ASD is withheld to protect the identities of these children and their families who live in Iceland which is a very small and close knit society. The study categorizes their level of schooling or work status at the time of the interviews.

Table 1: The participants and their children

Information about the children				
Participants	# of children	Level of schooling, or work status	Gender	ASD diagnosis
Parent 1	2 children	preschool	female	childhood autism
		secondary school	male	atypical autism
Parent 2	1 child	preschool	male	childhood autism
Parent 3	1 child	preschool	male	childhood autism
Parent 4	1 adult child	Employed	male	childhood autism
Parent 5	2 children	primary school	female	childhood autism+ ADHD
		primary school	female	Asperger+ ADHD

Part 2A & 2B

The same participants took part in both 2A & 2B. They consisted of 4 groups of students from 2 different age groups: 13-14 years of age and 16-17 years of age. The experimental groups consisted of students who had been diagnosed with ASD. The control groups consisted of students of the same age, who did not have an ASD diagnosis. The ages and number of participants in each group is illustrated in table 2. Students, who had parents that were native speakers of English, were not included in the study. Only one non-autistic student in the age bracket of 16-17 years was excluded for this reason. Obviously it would be expected that children of native speakers speak English at home. Thus, the frequency level that these children use English would not be pertinent information for this study.

Table 2: Number of participants

Experimental group (ASD diagnosis)		Control group (without ASD diagnosis)	
13-14 years	16-17 years	13-14 years	16-17 years
9 boys	6 boys	11 boys	7 boys
		10 girls	9 girls

The participants in the control group were found by contacting school administrators. Permission was requested for a class of students in each age group that were not diagnosed with ASD to participate in the study.

The experimental group was found through contacting 9 Icelandic schools with various types of special education facilities. As a result, 6 of these schools participated in the study. The rate of participation within each of these schools was often low but also varied between schools. The lack of participation was most often due to a lack of parental response.

3.2.2 Instruments of measurement

Part 1

An iPad was used to record the interviews with parents which were later transcribed for analysis. The participants were asked a total of seven interview questions in order to obtain the necessary information to compare the use of English and developmental patterns among these children. The interview questions are displayed in table 3.

Table 3: Interview questions

7 topics discussed in the interviews
1. What is your child's diagnosis?
2. What was language development like for your child?
3. How old was your child when he/she developed an interest for English?
4. How did your child show interest in English?
5. How does your child currently use English?
6. What effects does your child's English usage have on your family?
7. What reactions does your child's use of English receive in Icelandic society?

Part 2

In this part of the study a survey was used to measure how the participants used English. Also 2 different types of written vocabulary tests were used to measure the participant's abilities in lexical receptive English. Excel was used for analyzing the data collected in the survey, and calculators from a website called Social Science Statistics (n.d.) was used to analyze the data from both of the vocabulary tests. Two different types of vocabulary tests were used so a comparison could be made between receptive vocabulary ability in the yes/no test with the multiple choice test where reading comprehension was necessary to answer the questions correctly. The survey and vocabulary tests can be found in the appendix (see appendix A).

Test 1: The yes-no vocabulary test

The words chosen for the yes-no vocabulary test came from a test written by Paul Meara (1992) which was published on an online website called Complete Lexical Tutor (Cobb, n.d.). In a yes –no vocabulary test students simply read a list of words and non-words and mark the words that they know are real English words, leaving both the words they do not know and the non-words unmarked.

In this yes-no test, 20 non-words plus 25 words from four frequency levels were selected from this online vocabulary test (Meara,1992). The words were not individually selected with a specific purpose. Therefore the first 25 words in each frequency list were selected as published by the author of this test which was a total of 100 words (Meara,

1992). The selection was made with the purpose of avoiding that the words might become biased towards any of groups of participants.

Test 2: The multiple choice vocabulary test

The questions used in the second test also came from the online website, Complete Lexical Tutor (Cobb, n.d.). These question were selected from a test designed by Paul Nation and David Beglar (2007). This test was also set up to measure up to the 4000 frequency level. In this test students were presented with 16 multiple choice questions with 4 questions from each frequency level. Here the students simply read English phrases which included a word in bold in each phrase. The students were then asked to check the answer that most closely explained the meaning of the bold lettered word. The questions selected from this online multiple choice test were not individually selected. Rather the first 4 questions were selected from the online test for each of the 4 frequency levels, resulting in 16 total questions.

The survey

The survey questions were set up to be similar in design to other previous Icelandic studies where the focus has been on English usage among Icelanders. These previous studies included: Exposure to English in Iceland: A Qualitative and Qualitative study (Arnbjörnsdóttir , 2011) and English in the 4th grade in Iceland: Exploring exposure and measuring vocabulary size of 4th grade students (Jóhannsdóttir, 2010).

In the survey students answered 21 written questions. The first five questions inquired about basic information such as age, gender, country of birth and their parents country of birth. The survey was also set up so as to gather information of student's attitude towards both English class and Icelandic class. Students were also asked 14 questions regarding the frequency they use English. The students answered these questions by checking one of the following options regarding their frequency of English usage: everyday, 5-6 days a week, 3-4 days a week, 1-2 days a week or never (see appendix A).

3.2.3 Study design

The design of the study is illustrated in table 4. There are 2 parts in this study which look at English usage through interviews with parents, a survey about English usage, and 2 types of vocabulary tests to measure receptive lexical proficiency.

Table 4: Study design

Part 1: Interviews	Part 2: A survey and 2 vocabulary tests
1A.	2A.
Interviews with 5 parents of 7 children with ASD that claim to prefer English over their native tongue.	A survey that asks students to estimate their frequency of English usage and their proficiency levels.
	2B.
	Two English vocabulary tests that measure proficiency in recognition of written English words.

3.2.4 Procedure:

Part 1:

In the interviews the participants, who were parents of children with ASD, were first informed that the study had been registered with The Data Protection Authority *(i. Persónuvernd*) and that the data would be handled according to the rules of The Data Protection Authority. The participants also consented to their interviews being recorded on an iPad. During the interviews the participants answered questions about their child's language development, and how their child uses English. The participants were also encouraged to talk about other issues that they found pertinent in regards to their children's language choices, communication abilities, personal identity and language development.

Part 2

The procedures used for instructing the participants who answered the survey and vocabulary tests varied slightly between the control groups and the experimental groups. Both procedures are described in the following section.

The procedure used for the control groups

The author of the study met with a class of students in each age group and explained the purpose of the study was to investigate English usage among young people who are now living in a more globalized society. The students were also told that the study was voluntary. The students were asked to fill out the survey and encouraged to ask questions, if they found something to be unclear.

The students also received instructions for answering the vocabulary tests. In the yes/no test, the students were instructed to put an x beside the English words that they knew and could use in a sentence. They were also informed that there were non-words in the test, and it was explained that the purpose of the non-words was to ensure that the participants wouldn't put an x next to all the words.

The procedure used with the experimental groups

The author of the study met with all the participants with ASD in the experimental group on an individual basis. These students were offered assistance in reading and writing the answers to the survey. The same procedure was then used to instruct these students about answering the survey and vocabulary tests. If there were indications that the participant did not understand the questions in the survey, then the author re-worded the questions in a simpler fashion to ensure that the participants understood each survey question. The participants were encouraged to talk with the author of the study about how they were using English. The vocabulary test was taken using the same procedure as the control group. Here the author refrained in discussion while each student with ASD took the vocabulary tests on their own.

4. Data Analysis and results

This section has been set up to report the results of both part 1 and part 2 of this study. Part 1A and 2A are designed to address the first research question which identifies differences in how young people with ASD use English in comparison to their peers. Part 2B is designed to look at the 2nd research question which deals with lexical proficiency. Finally the 3rd research question is addressed through exploring relationships between the vocabulary scores and the survey questions.

4.1 Part 1

There were two patterns of language usage and development that were described in the interviews. The first pattern was found among the children in preschool, and the other pattern was found among all the other older participants.

4.1.1 Interview results for the preschoolers

All 3 of the children in preschool were described by their parents as strongly influenced by digital sources such as iPad applications and English music on YouTube. These children were said to use English words on a daily basis and were described by their parents as preferring to use English. The language development among all 3 of these children was described as unusual because they were acquiring beginning language skills in both English and Icelandic simultaneously. All 3 of these parents reported that their children were exposed daily to English through digital sources and their exposure to Icelandic was also occurring daily through personal contact with family members, preschool staff and other Icelandic children. All 3 of these preschoolers were diagnosed with childhood autism, and two of them were described as seldom using language with the purpose of communicating. Their language behavior was described rather as having little apparent purpose. These 2 children were said to randomly name objects, letters and numbers in English. The third preschooler in the study differed from the other 2 because this individual sometimes used language to communicate rather than simply naming objects. However, this child also used English primarily in Icelandic environments as did the other 2 preschoolers.

All 3 parents described the same type of intervention where specialists had recommended that English usage in Icelandic environments be addressed by simply not

responding to the spoken English. One of the preschools had instructed staff to consistently tell the child with ASD that they didn't understand him each time he spoke to them in English. This simple intervention was enough to eventually change the language behavior of this particular preschooler where he began to speak only in Icelandic in preschool. However, the parents of the children, who struggled most with communication, expressed dissatisfaction with this type of intervention. Both of these parents described feeling very concerned about their children's lack of communication and wanted all communication to be reinforced with the hope that their children would eventually use language to communicate with them. For these parents the form of communication did not matter. Both of these parents were concerned that restricting reinforcement for Icelandic only might have a negative impact on their child's language abilities. The results are displayed below in table 5.

Table 5: Results of the intervention

	intervention	communication mode	Parental response /success level
preschool child #1	reinforcement for only Icelandic	seldom communicated but mostly in English	skeptical/ still problematic
preschool child #2	reinforcement for only Icelandic	seldom communicated but mostly in English	skeptical/still problematic
preschool child #3	reinforcement for only Icelandic	Mostly in English & some Icelandic	supportive/ successful intervention

4.1.2 Interview results for the older children

The second pattern of development emerged among the 4 older individuals with ASD. These individuals learned to speak Icelandic rather than English as young children. Three of these individuals began learning English through exposure to various types of media early in primary school, and as a result, they spoke a great deal of English. However, one

individual did not begin using English until his early teens. This individual was significantly older than the other participants. He described developing an interest for English during his early teenage years when computer games such as play-station and other popular forms of English media were becoming popular in Iceland. The other younger participants, whose interests in English began in early in primary school, were all described by their parents as having high levels of motivation for speaking English that were strongly associated with interests and hobbies such as Harry Potter, American movies and online gaming. Three of the participants had especially strong interests in American culture and were described as having American accents. One individual was described by their parent as having developed a RP(high-class) English accent and was extremely interested in Harry Potter. Another individual was described by their parent as not only wanting to speak American-English, but also wanted to become an American. Two of these individuals were described as feeling very much at home while speaking English to Americans during vacations in the USA.

All of these individuals spoke English daily and often spoke English with their friends. For example, one of the teenage individuals was said to regularly meet with a friend who also had ASD, and these two friends spoke English to one another while playing computer games. Another individual was involved in an organized group that did role playing called Living Action Role Play (LARP). This group was described as always communicating in English during their enactments. Three of the older children were described by their parents as having an extensive English vocabulary. Only the individual with Asperger Syndrome was described as an avid reader of English books. One individual was described as only reading directions for computer games. Two of the children were described as having severe difficulties regarding reading. The oldest individual in the study was described as having reading difficulties, but often enjoyed reading English comic books. These characteristics have been set up in table 6.

Table 6: Descriptive characteristics of the older children who prefer English

Individuals	Characteristics			
	Diagnosis	Interests	Accent	Reading habits
Individual #1 (primary school)	Childhood autism &ADHD	Minecraft and YouTube	American	Difficulties in reading
Individual #2 (primary school)	Asperger Syndrome & ADHD	Harry Potter and LARP	"High-class" English	Avid reader of English books
Individual #3 (secondary school)	Atypical autism &ADD	Online gaming & computer games	American	Reads manuals for computer games
Individual #4 (employed adult)	Childhood autism	American movies and Pokémon	American	Difficulties in reading but likes comic books

When looking at how the daily use of English affects Icelandic family life, the parents reported various effects. Three of the parents described their children's tendencies to use English as very easy to adjust to. All three of these parents described themselves as proficient in English. The other 2 parents described their children's usage of English as occasionally causing stress in family life. One parent described their child with ASD as being more proficient in English than other family members. This lack of proficiency in English among certain family members was described as sometimes leading to tension and misunderstandings among family members.

All four of the parents of the older children in the study described that their children often had great difficulty communicating their emotions in Icelandic and preschool child # 3 had a strong preference for expressing emotion in English. All of these parents expressed that they wanted their children to learn to use Icelandic proficiently. However, they all described making exceptions for their children to speak English during emotional times. These parents found it inhumane to deny their children the comfort of speaking English during such trying moments in life.

When inquiring about reactions that this high level of English usage might receive in Icelandic society, all the parents described Icelandic society as being rather open and accepting towards this alternative communication mode. One parent described that English proficiency was her child's strength and this often led to Icelanders expressing admiration and praise of this ability. This child's level of English proficiency was also described as helping this particular child emotionally, leading to a positive sense of self-pride. Another parent described that people often commented about the oddness of how her child chooses to speak English. However, this parent also emphasized that people were not rude or critical of this choice. Another parent described being asked on numerous occasions why her child has chosen to speak English. This parent explained that she believed that speaking in a second language with her child had the effect of helping her child feel equivalent to herself and others during a conversation. She described that she experienced that her child felt inferior while speaking Icelandic due to a lack of proficiency in the language. This parent explained that her son was skilled in self-expression when using English which resulted in a strong tendency to choose English rather than Icelandic. Another parent described that her child was often corrected while speaking Icelandic, and therefore felt criticized. This parent described that this critical reaction to her child's Icelandic skills contrasted greatly from the positive attention and praise her child often received while speaking English. This parent believed that this positive attention was what lead to her child to choose to speak English rather than Icelandic. Another parent described that her child excelled in English to the degree that the school system provided her child with advanced reading material in English. This material was described as being approximately two years ahead of the material most of the other students were using in this child's class. This parent had much praise for the schools response and teaching methods which were used to encourage her children to excel academically in English. This academic success was described as a positive influence in these children's lives.

4.2 Part 2

The results in part 2 consist of the survey and the 2 vocabulary tests. The results of the survey address the first research question. Here chi-square analyses are used to identify differences in how young Icelanders use English. Similarly, the results of the vocabulary

tests address the second research question regarding lexical proficiency. Here the Mann-Whitney U test is used to determine whether young Icelanders with ASD attain the same level of lexical proficiency in English as their non-autistic peers

4.2.1 The survey results

It is important to emphasize for this part of the study that using chi-square to determine significance for such small samples is controversial. Therefore the results should not be interpreted as highly reliable and should rather be considered as a potential indication of the situation in Iceland. An alpha level of .05 was used for all of the analyses. Four individual comparisons were made for each survey question. The purpose of these comparisons is to identify the causes of significant differences among the various groups of participants. This comparison identifies factors caused by age, gender, and ASD. The chi-square comparisons are as follows:

1. Boys with ASD (13-14 years) were compared to age equivalent non-autistic boys.
2. Boys with ASD (16-17 years) were compared to age equivalent non-autistic boys.
3. Non-autistic boys (13-14 years) were compared to non-autistic girls.
4. Non-autistic boys (16-17 years) were compared to non-autistic girls.

Chi-square analyses revealed 7 differences when comparing the results of the survey questions among the 6 groups of participants. However only 2 of these differences could be associated with autism, and one survey question was found to pertain to both autism and gender. Notably gender was identified as the factor causing differences in 4 of the 7 comparisons made with chi-square analyses. Table 7 is set up to display the results of the survey as a whole. Then the results are reported in both tables and with descriptions for each individual survey question where significant differences were found when comparing English usage.

Table 7: Significant differences found in the survey with chi-square analysis

The survey questions	differences caused by		
	ASD	gender	ASD + gender
How often do you play computer games that are in English?		X	
How often do you use English to communicate with other players while gaming online?		X	
How often do you speak English with your friends?		X	
How often do you speak English to other family members other than your parents? (e.g. siblings)		X	
How often do you write English comments on YouTube ?	X		
How good are you at reading in English?	X		
How often do you write in English on social media pages? (chat, Skype, snapchat, fb, Twitter)			X

The results of survey question #5: How often do you play computer games that are in English?

Many of the non-autistic boys as well as the groups of boys with ASD reported that they play computer games daily. Here 77.8% (n=7) of the boys with ASD in the age bracket of 13-14 years and 33,3% (n=2) of the boys with ASD in the age bracket of 16-17 years reported playing computer games daily. When looking at their non-autistic male peers, 45.5% (n=5) of the boys in the age bracket of 13-14 years and 71.4% (n=5) of the boys in the age bracket of 16-17 years also reported playing computer games daily. This contrasted with the groups of girls where 30% (n=3) of the girls in the age group of 13-14 years of age and 55.6% (n=5) of the girls 16-17 years of age reported that they never play computer games. The results of survey question 5 are shown in table 8.

Chi-square analysis revealed that there were significant differences in the comparison of boys to girls in the age bracket of 16-17 yrs, $X^2(3, N = 16) = 11.34$, $p = .01$. These results indicate there are significant differences due to the effects of gender in this sample, as reported in table 8.

Table 8: The frequency that Icelandic students play computer games in English

	N	Everyday	5-6 days	3-4 days	1-2 days	Never
Boys 13-14 yrs (ASD)	9	77.8%	0%	22.2%	0%	0%
Boys 13-14 yrs (non-autistic)	11	45.5%	9.1%	27.3%	18.2%	0%
Girls 13-14 yrs (non-autistic)	10	20.0%	10.0%	10.0%	30.0%	30.0%
Boys 16-17 yrs(ASD)	6	33.3%	16.7%	0%	0%	50.0%
Boys 16-17 yrs (non-autistic)	7	71.4%	0%	0%	28.6%	0%
Girls 16-17 yrs (non-autistic)	9	0%	0%	11.1%	33.3	55.6%

The results of survey question #6 *How often do you use English to communicate with other players while gaming online?*

When looking at the results about gaming, it is notable that all of the girls in the age group of 16-17 years of age (N=9) reported never using English while gaming, and 80% (n=8) of the girls in the age bracket of 13-14 years also reported the same. Only 33.3% (n=2) of boys in the age bracket of 13-14 years of age with ASD reported never using English while gaming along with 54.5 % (n= 6) of their non-autistic peers. While 42.9% (n=3) of non-autistic boys ages 16-17 years also reported never gaming.

The results from chi-square analysis revealed significant differences only in the comparison of boys to girls ages 16-17, $X^2(2, N = 16) = 7.01$, $p = 0.03$. These results indicate that there may be potential gender differences connected to gaming online. These results are reported below in table 9.

Table 9: The frequency that students use English while gaming online

	N	Everyday	5-6 days	3-4 days	1-2 days	Never
Boys 13-14 yrs (ASD)	9	33.3%	0%	11.1%	22.2%	33.3%
Boys 13-14 yrs (non-autistic)	11	9.1%	0%	18.2%	18.2%	54.5%
Girls 13-14 yrs (non-autistic)	10	0%	0%	10.0%	10.0%	80.0%
Boys 16-17 yrs(ASD)	6	50.0%	0%	0%	16.7%	33.3%
Boys 16-17 yrs (non-autistic)	7	28.6%	0%	0%	28.6%	42.9%
Girls 16-17 yrs (non-autistic)	9	0%	0%	0%	0%	100.0%

Survey question # 7: How often do you speak English with your friends?

The results in table 10 report that there are many young Icelanders who claim they never speak English with their friends with the exception of the group of boys with ASD in the age bracket of 16-17 years where all of these individuals (n=6) report speaking with their friends in English at various frequencies on a weekly basis. The data in the table also shows that 50% (n=3) of the boys with ASD in the age group of 16-17 years and 57.1% (n=4) of their non-autistic peers reported that they speak English daily with their friends. This data indicates that there are young Icelandic individuals who use English to communicate with their friends on a weekly basis. However, chi-square analysis revealed significant differences only in the comparison of non-autistic boys compared to non-autistic girls in the age bracket of 16-17 years, $X^2(4, N = 16) = 10.03$, $p = 0.04$. Thus Icelandic boys in the age bracket of 16-17 years of age may be more likely to speak English with their friends than their age equivalent female peers. These results may indicate that gender differences play a role in this issue.

Table 10: The frequency that Icelandic students speak English with their friends

	N	Everyday	5-6 days	3-4 days	1-2 days	Never
Boys 13-14 yrs (ASD)	9	22.2%	0%	0%	44.4%	33.3%
Boys 13-14 yrs (non-autistic)	11	9.1%	0%	0%	9.1%	81.8%
Girls 13-14 yrs (non-autistic)	10	0%	20.0%	0%	30.0%	50.0%
Boys 16-17 yrs(ASD)	6	50.0%	0%	33.3%	16.7%	0%
Boys 16-17 yrs (non-autistic)	7	57.1%	0%	0%	0%	42.9%
Girls 16-17 yrs (non-autistic)	9	22.2%	0%	0%	44.4%	33.3%

Survey question # 11.How often do you speak English to other family members other than your parents? (e.g. siblings)

The results in table 11 support the view that very few of the participants speak English with family members. Here there is only 1 one individual in the ASD group in the age bracket of 13-14 years of age who reported that he speaks English daily to other family members. It is also notable that 90.9% (n=10) of the boys in the age bracket of 13-14 years of age reported never speaking English to other family members. While 50.0% of the girls in the age bracket of 13-14 years do the same. Chi-square analysis revealed significant differences only in the comparison among non-autistic girls in the age bracket of 13-14 years with non-autistic boys $X^2(1, N = 21) = 4.22$, $p = 0.04$. These results indicate that these girls may be somewhat more likely to speak English to other family members than non-autistic age equivalent male peers. However, it is important to note that the p value is somewhat high in the results with $p = 0.04$.

Table 11: The frequency that students speak English to other family members

	N	Everyday	5-6 days	3-4 days	1-2 days	Never
Boys 13-14 yrs (ASD)	9	11.1%	0%	0%	11.1%	77,8%
Boys 13-14 yrs (non-autistic)	11	0%	0%	0%	9.1%	90.9%
Girls 13-14 yrs (non-autistic)	10	0%	0%	0%	50.0%	50.0%
Boys 16-17 yrs(ASD)	6	0%	0%	0%	33.3%	66.7%
Boys 16-17 yrs (non-autistic)	7	0%	0%	0%	14.3%	85.7%
Girls 16-17 yrs (non-autistic)	9	0%	11.1%	11.1%	44.4%	33.3%

Survey question # 9: How often do you write English comments on YouTube ?

In the results of survey question #9 it is notable to compare the ASD groups to their non-autistic peers. Here 62.5% (n=5) of boys with ASD ages 13-14 years of age and 50% (n=3) of boys with ASD in the age bracket of 16-17 years report that they write English comments on YouTube daily. This contrasts with all of their non-autistic peers where none of the girls or boys in the age bracket of 13-14 years of age report that they write daily comments in English on YouTube. Only 1 individual among their non-autistic peers in the age bracket of 16-17 years reported that he writes English comments everyday on YouTube. Chi-square analysis revealed significant differences only in the comparison of the boys with ASD with their non-autistic peers in the age group of 13-14 years, $X^2(4, N = 19) = 13.28$, $p = 0.01$. This may indicate that writing comments on YouTube on a daily basis may be a behavior that is linked to ASD in Iceland. These results are reported in table 12.

Table 12: The frequency that students write English comments on YouTube.

	N	Everyday	5-6 days	3-4 days	1-2 days	Never
Boys 13-14 yrs (ASD)	9	62.5%	12.5%	0%	0%	25.0%
Boys 13-14 yrs (non-autistic)	11	0%	0%	9.1%	27.3%	63.6%
Girls 13-14 yrs (non-autistic)	10	0%	10.0%	0%	20.0%	70.0%
Boys 16-17 yrs(ASD)	6	50%	0%	16.7%	16.7%	16.7%
Boys 16-17 yrs (non-autistic)	7	14.3%	0%	0%	0%	85.7%
Girls 16-17 yrs (non-autistic)	9	0%	0%	0%	0%	100.0%

Survey question: How good are you at reading in English?

The results in table 13 may indicate that Icelandic students with ASD of the ages 13-14 years tend to rate themselves as somewhat less proficient in reading in English than their non-autistic peers. Here 2 individuals which is 22.2% of boys with ASD rated their own reading skills in English as poor. This is slightly more than in the other groups. None of the non-autistic boys in either group gave themselves a poor rating, nor did any of the boys with ASD ages 16-17 give themselves a rating of poor in reading English. Only 1 girl in the age bracket of 13-14 years rated herself as poor in reading English. Chi-square analysis revealed significant differences in how the boys with ASD ages 13-14 years rated themselves in reading English as compared to their non-autistic male peers, X^2 (3, N = 20) = 9.84, p = 0.02. These results suggest that boys ages 13-14 years of age with ASD may have a tendency to believe that they are less proficient in reading English in comparison to their non-autistic male peers.

Table 13: How proficient did Icelandic students claim to be in reading in English?

	N	Very good	Rather good	Rather poor	Poor
Boys 13-14 yrs (ASD)	9	33.3%	0%	44.4%	22.2%
Boys 13-14 yrs (non-autistic)	11	36.4%	54.5%	9.1%	0%
Girls 13-14 yrs (non-autistic)	10	30.0%	50.0%	10.0%	10.0%
Boys 16-17 yrs(ASD)	6	50.0%	33.3%	16.7%	0%
Boys 16-17 yrs (non-autistic)	7	42.9%	42.9%	14.3%	0%
Girls 16-17 yrs (non-autistic)	9	55.6%	11.1%	22.2%	11.1%

Survey question # 13: How often do you write in English on social media pages? (chat, Skype, snapchat, fb, Twitter) The results as shown in table 14 show that 71.4% (n=5) of non-autistic boys ages 16-17 reported that they write in English on social media pages every day. All of the boys (n=7) in this group reported that they engage in this activity at various frequencies on a weekly basis. This differed from the ASD groups where 55.6% (n= 5) of non-autistic boys in the age bracket of 13-14 years and 66.7% (n=4) of boys with ASD ages 16-17 years reported that they never write on social media pages. Two different comparisons using chi-square analyses revealed significant differences in the frequency with which they write in English on social media pages. These findings revealed that the boys with ASD in the age bracket of 16-17 years reported writing significantly less frequent in English on social media pages than their non-autistic male peers, $X2(4, N = 21) = 9.49$, $p = 0.02$. Chi-square analysis also revealed significant differences in the comparison of non-autistic boys ages 13-14 years of age with their non-autistic female peers, $X2(4, N = 21) = 9.49$, $p = 0.05$ suggesting both gender differences and differences due to ASD contributing to how often students tend to write on social media pages.

Table 14: The frequency students write in English on social media pages

	N	Everyday	5-6 days	3-4 days	1-2 days	Never
Boys 13-14 yrs (ASD)	9	11.1%	22.2%	0%	11.1%	55.6%
Boys 13-14 yrs (non-autistic)	11	27.3%	9.1%	18.2%	9.1%	36.4%
Girls 13-14 yrs (non-autistic)	10	0%	0%	30.0%	60.0%	10.0
Boys 16-17 yrs(ASD)	6	16.7%	16.7%	0%	0%	66.7%
Boys 16-17 yrs (non-autistic)	7	71.4%	0%	0%	28.6%	0%
Girls 16-17 yrs (non-autistic)	9	22.2%	11.1%	33.3%	22.2%	11.1%

4.2.2 The Results of the Vocabulary tests

This section looks at the second research question which focuses on lexical proficiency. Here the results of both vocabulary tests are presented. Due to the small sample sizes and thus a lack of normal distribution, the nonparametric Mann-Whitney U test is used to analyze the data. The following comparisons are made to determine whether there are significant differences in lexical proficiency between the groups:

1. Boys with ASD ages 13-14 years compared to age equivalent, non-autistic boys
2. Boys with ASD ages 16-17 years compared to age equivalent, non-autistic boys
3. Non-autistic boys ages 13-14 years compared to non-autistic, age equivalent girls
4. Non-autistic boys ages 16-17 years compared to non-autistic, age equivalent girls

These 4 comparisons are made for both the yes-no vocabulary test and also for the multiple choice test. Both the combined results for all frequency levels of vocabulary are analyzed, as well as all four individual frequency levels. Frequency level 1 looks at the most frequent and common words in English. The subsequent levels become increasingly difficult, testing words that are less frequent. Thus, frequency level 4 measures the least frequent words. This level is therefore likely to be the most difficult. There are 40 comparisons made in total using the Mann-Whitney U test.

With the purpose of increasing the reliability of the results of the yes-no tests, all tests that had more than 5 non-words marked were excluded from the final analysis of the data. As a result there were 7 vocabulary tests excluded as reported in table 15.

Table 15: Tests that were excluded from the final analysis.

Groups	Number of tests excluded
Boys 13-14 ASD	4
Boys 16-17 ASD	0
Boys 13-14 non-autistic	1
Girls 13-14 non-autistic	0
Boys 16-17 non-autistic	1
Girls 16-17 non-autistic	1

The yes-no vocabulary test

The following section reports the results of the yes-no test. The first two comparisons are designed to look at the effects of ASD, and the final two comparisons look at the effects of gender.

Comparison 1: boys with ASD with non-autistic boys (ages 13-14)

Boys 13-14 years of age with ASD (N=6) were compared to age equivalent non-autistic boys (N=10). In the results from level 1, the U-value is 24.5. Thus the critical value of U at $p \leq 0.05$ is 8. The result is not significant at $p \leq 0.05$. When looking at level 2, the U-value is 22. The critical value of U at $p \leq 0.05$ is 8. The result is not significant at $p \leq 0.05$. When looking at level 3, the U-value is 23.5. The critical value of U at $p \leq 0.05$ is 8. Therefore, the result is not significant at $p \leq 0.05$. In the results from level 4, the U-value is 23. The critical value of U at $p \leq 0.05$ is 8. Thus, the result is not significant at $p \leq 0.05$. When comparing the results from all four levels, the U-value is 23. The critical value of U at $p \leq 0.05$ is 8. Therefore, the result is not significant at $p \leq 0.05$. There were no significant differences found in any of the comparisons made when looking at boys with ASD ages 13-14 years in comparison to their non-autistic male peers in the yes-no vocabulary test.

Comparison 2: boys with ASD with non-autistic boys (ages 16-17)

Boys 16-17 years with ASD (N=5) were compared to age equivalent non-autistic boys (N=6). In the results from level 1, the U-value is 13. The critical value of U at $p \leq 0.05$ is 5. This result is not significant at $p \leq 0.05$. In the results from level 2, the U-value is 15. The critical value of U at $p \leq 0.05$ is 5. This result is not significant at $p \leq 0.05$. In the results from level 3, the U-value is 12.5. The critical value of U at $p \leq 0.05$ is 5. This result is not significant at $p \leq 0.05$. In the results from level 4 the U-value is 13.5. The critical value of U at $p \leq 0.05$ is 5. This result is not significant at $p \leq 0.05$. When comparing the results of all four levels together, the U-value is 12. The critical value of U at $p \leq 0.05$ is 5. Therefore, these results are not significant at $p \leq 0.05$. Thus there were no significant differences found in the yes-no vocabulary tests when comparing boys with ASD ages 16-17 years with their non-autistic male peers.

Comparison 3: non-autistic boys with non-autistic girls (13-14 yrs)

Non-autistic boys ages 13-14 years (N=10) were compared to age equivalent, non-autistic girls (N=10). In the results from level 1 the U-value is 40.5. The critical value of U at $p \leq$ 0.05 is 23. This result is not significant at $p \leq$ 0.05. In the results from level 2, the U-value is 35. The critical value of U at $p \leq$ 0.05 is 23. The result is not significant at $p \leq$ 0.05. In the results from level 3, the U-value is 37.5. The critical value of U at $p \leq$ 0.05 is 23. This result is not significant at $p \leq$ 0.05. In the results from level 4, the U-value is 37.5. The critical value of U at $p \leq$ 0.05 is 23. Therefore, the result is not significant at $p \leq$ 0.05. In the combined results from all levels, the U-value is 36.5. The critical value of U at $p \leq$ 0.05 is 23. Therefore the result is not significant at $p \leq$ 0.05. Thus there were no significant differences found in the results of the yes-no vocabulary tests when comparing non-autistic boys ages 13-14 years with their non-autistic female peers.

Comparison 4: non-autistic boys with non-autistic girls (16-17 yrs)

Non-autistic boys ages 16-17 years (N=6) were compared to age equivalent, non-autistic girls (N=8). In the results from level 1 the U-value is 15. The critical value of U at $p \leq$ 0.05 is 8. Therefore, the result is not significant at $p \leq$ 0.05. In the results from level 2, the U-value is 5. The critical value of U at $p \leq$ 0.05 is 8. The result is significant at $p \leq$ 0.05. In the results from level 3, the U-value is 12.5. The critical value of U at $p \leq$ 0.05 is 8. This result is not significant at $p \leq$ 0.05. In the results from level 4, the U-value is 6.5. The critical value of U at $p \leq$ 0.05 is 8. Therefore, the result is significant at $p \leq$ 0.05. In the combined results from all levels, the U-value is 8.5. The critical value of U at $p \leq$ 0.05 is 8. Therefore, the result is not significant at $p \leq$ 0.05. Although this comparison showed a non-significant difference for total outcome, a gender difference was found in levels 2 and 4.

Here in table 16 the results of the yes-no vocabulary test are presented. Significant differences were found with the Mann-Whitney U test only when comparing non-autistic boys with non-autistic girls ages 16-17 in levels 2 and 4.

Table 16: Yes/No vocabulary test

	Groups categorized by ASD diagnosis, age & gender					
	ASD groups		Non-autistic groups			
vocabulary frequency level	boys 13-14yrs	boys 16-17 yrs	boys 13-14 yrs	girls 13-14 yrs	boys 16-17 yrs	girls 16-17 yrs
Level 1						
M # of words correct	22.60	24.17	23.2	21.2	23.67	22.38
%	90.4%	96.67%	92.8%	84.8%	94.67%	85.5%
SD	3.36	2.04	2.25	5.03	1.97	4.0
Level 2						
M # of words correct	14.00	20.33	15.8	12.5	20.67	11.13
%	56.0%	81.33%	63.2%	50.0%	82.67%	44.5%
SD	9.14	7.12	4.98	5.87	3.67	6.53
Level 3						
M # of words correct	17.80	22.17	19.7	16.3	21.33	15.63
%	71.2%	88.67%	78.8%	65.2%	85.33%	62.5%
SD	7.36	5.53	3.53	7.57	3.98	7.23
Level 4						
M # of words correct	14.60	19.0	15.0	12.8	19.33	11.75
%	58.4%	76.0%	60.0%	51.2%	77.33%	47.0%
SD	9.13	7.38	4.03	5.63	3.39	6.5
Total outcome						
M# of words correct	69.0	85.67	73.7	62.8	85.0	59.88
%	69.0%	85.67%	73.7%	62.8%	85.0%	59.88
SD	28.32	21.98	13.73	23.2	12.46	23.39

The multiple choice test

The following section presents the data from the multiple choice vocabulary tests . The first two comparisons look at the effects of ASD, and the final two comparisons look at the effects of gender.

Comparison 1: boys with ASD with non-autistic boys (ages 13-14)

Boys 13-14 years of age with ASD (N=6) were compared to age equivalent, non-autistic boys (N=10). In the results from level 1 the U-value is 22.5. The critical value of U at $p \leq$ 0.05 is 8. The result is not significant at $p \leq$ 0.05. In the results from level 2, the U-value is 23. The critical value of U at $p \leq$ 0.05 is 8. Therefore, the result is not significant at $p \leq$ 0.05. In the results from level 3, the U-value is 16. The critical value of U at $p \leq$ 0.05 is 8. Therefore, the result is not significant at $p \leq$ 0.05. In the results from level 4, the U-value is 11. The critical value of U is $p \leq$ 0.05 is 8. Therefore, the result is not significant at $p \leq$ 0.05. In the combined results from all levels, the U-value is 17. The critical value of U at $p \leq$ 0.05 is 8. Therefore, the result is not significant at $p \leq$ 0.05. Thus there were no significant differences found in the results of the multiple choice vocabulary tests when comparing boys with ASD ages 13-14 years with their non-autistic male peers.

Comparison 2: boys with ASD with non-autistic boys (ages 16-17)

Boys 16-17 years with ASD (N=5) were compared to age equivalent, non-autistic boys (N=6). In the results from level 1, the U-value is 7.5. The critical value of U at $p \leq$ 0.05 is 5. The result is not significant at $p \leq$ 0.05. In the results from level 2, the U-value is 17. The critical value of U at $p \leq$ 0.05 is 5. This result is not significant at $p \leq$ 0.05. In the results from level 3, the U-value is 16. The critical value of U at $p \leq$ 0.05 is 5. The result is not significant at $p \leq$ 0.05. In the results from level 4, the U-value is 17. The critical value of U at $p \leq$ 0.05 is 5. Therefore, the result is not significant at $p \leq$ 0.05. In the combined results from all levels, the U-value is 14. The critical value of U at $p \leq$ 0.05 is 5. Therefore, the result is not significant at $p \leq$ 0.05. Thus there were no significant differences found in the results of the multiple choice vocabulary tests when comparing boys with ASD ages 16-17 years with their non-autistic male peers.

Comparison 3: non-autistic boys with non-autistic girls (13-14 yrs)

Non-autistic boys ages 13-14 years (N=10) were compared to age equivalent, non-autistic girls (N=10). In the results from level 1, the U-value is 48.5. The critical value of U at p≤ 0.05 is 23. Therefore, the result is not significant at p≤ 0.05. In the results from level 2, the U-value is 35.5. The critical value of U at p≤ 0.05 is 23. Therefore, the result is not significant at p≤ 0.05. In the results from level 3, the U-value is 39. The critical value of U at p≤ 0.05 is 23. Therefore, the result is not significant at p≤ 0.05. In the results from level 4, the U-value is 41.5. The critical value of U at p≤ 0.05 is 23. Therefore, the result is not significant at p≤ 0.05. In the combined results from all levels, the U-value is 35. The critical value of U at p≤ 0.05 is 23. Therefore, the result is not significant at p≤ 0.05. Thus there were no significant differences found in the results of the multiple choice vocabulary tests when comparing non-autistic boys ages 13-14 years with their non-autistic female peers.

Comparison 4: non-autistic boys with non-autistic girls (16-17 yrs

Non-autistic boys ages 16-17 years (N=6) were compared to age equivalent, non-autistic girls (N=8). In the results of level 1, the U-value is 15. The critical value of U at p≤ 0.05 is 8. The result is not significant at p≤ 0.05. In the results of level 2, the U-value is 15. The critical value of U at p≤ 0.05 is 8. Therefore, the result is not significant at p≤ 0.05. In the results of level 3, the U-value is 11.5. The critical value of U at p≤ 0.05 is 8. The result is not significant at p≤ 0.05. In the results of level 4, the U-value is 12. The critical value of U at p≤ 0.05 is 8. Therefore, the result is not significant at p≤ 0.05. In the combined results from all levels, the U-value is 12. The critical value of U at p≤ 0.05 is 8. Therefore, the result is not significant at p≤ 0.05. Thus there were no significant differences found in the results of the multiple choice vocabulary tests when comparing non-autistic boys ages 16-17 years with their non-autistic female peers.

Here in table 17 the results of the multiple choice test are presented. The Mann-Whitney U test revealed no significant differences when comparing the groups.

Table 17: Multiple choice vocabulary test

	Groups categorized by ASD diagnosis, age & gender					
	ASD groups		Non-autistic groups			
vocabulary frequency level	boys 13-14yrs	boys 16-17 yrs	boys 13-14 yrs	girls 13-14 yrs	boys 16-17 yrs	girls 16-17 yrs
Level 1						
M # of words correct	2.8	2.67	2.7	2.6	3.5	3.0
%	70.0%	66.67%	67.5%	65.0%	87.5%	75.0%
SD	1.3	0.82	0.82	0.97	0.55	0.76
Level 2						
M# of words correct	3.0	3.67	3.1	2.5	3.5	2.75
%	75.0%	91.67%	77.5%	62.5%	87.5%	68.75%
SD	1.0	0.52	1.1	1.27	0.84	1.16
Level 3						
M # of words correct	3.2	3.67	2.6	2.1	3.67	2.88
%	80.0%	91.67%	65.0%	52.5%	91.67%	71.88%
SD	1.3	0.52	1.07	1.37	0.82	0.99
Level 4						
M# of words correct	2.2	1.67	1.3	1.00	1.67	1.0
%	55.0%	41.67%	32.5%	25.0%	41.67%	25.0%
SD	0.84	1.03	0.82	0.82	0.52	0.76
Total outcome						
M# of words correct	11.2	11.67	9.7	8.20	12.33	9.63
%	70.0%	72.92%	60.63%	51.25%	77.08%	60.16%
SD	3.9	1.86	2.79	3.65	2.07	3.29

The following bar chart in figure 1 displays the results of the vocabulary tests. Here the mean percentage correct is used in the bar chart to illustrate the results for all groups in each level and also for all the results of the tests as a whole. Here one can observe that the non-autistic boys ages 16-17 scored consistently highest in all levels. These non-autistic 16-17 year old boys were found to perform significantly better than their non-autistic female peers as found in the Mann Whitney U test. It is also notable that the boys with ASD ages 13-14 years scored almost as high as the older group of non-autistic boys ages 16-17. The results of the vocabulary tests show a different pattern of scores than was predicted as it showed that many of the students marked more words correct in level 3 than in level 2. Notably this pattern was found among both the individuals with ASD as well as their non-autistic peers. The first research question in this study has the purpose of identifying whether young Icelanders with ASD achieve the same level of receptive lexical proficiency in English as their non-autistic peers, thus this information is not pertinent to this study's research question and will not be further addressed.
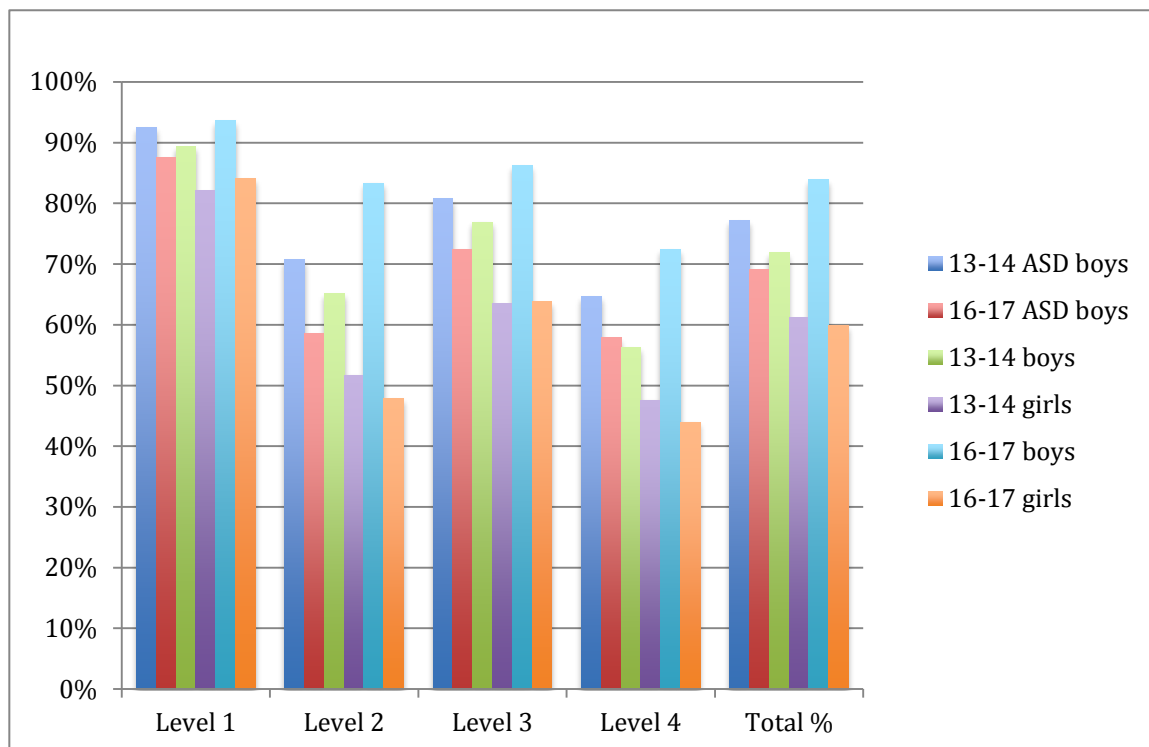
Figure 1: Mean percentage of correct answers for both vocabulary tests

The question of reliability of the tests

It is also important to look at the correlation level of these 2 vocabulary tests to establish reliability. In the multiple choice test students needed to interpret the meaning of the words used in sentences, while they only needed to check the words they knew in the yes/no test. These different testing techniques might lead to different results. However, in this study there is a high level of correlation where the results of the multiple choice test and the yes-no test were positively correlated, $r = 0.76$, $p = < 0.01$. This supports the reliability of both tests. The following graph compares the results of both tests for each of the individual participants. Here it can be observed that the patterns of both the test scores are very similar. The blue color is used to report the results for the yes-no test and the red color is used for the results of the multiple-choice test. This pattern, as shown in figure 1, supports that most of the participants scored very similar in both tests.
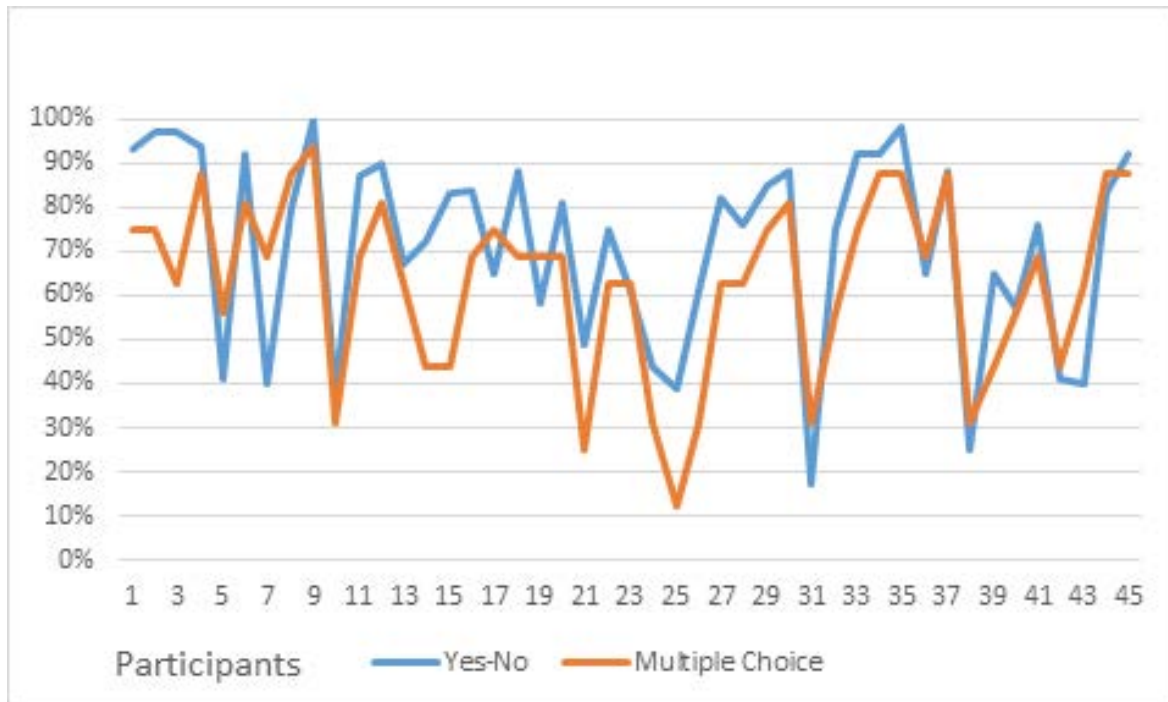
Figure 2: A comparison of the individual results of both vocabulary tests

As this study focuses on finding differences due to ASD, it is important to consider the range and distribution of the data from the vocabulary tests. Thus, figure 3 displays the diversity of the results within each of the groups compared. It is also notable that there is a possible outlier in the group with ASD ages 16-17 years. This possible outlier has the effect of reducing the mean percentage in this older group of individuals with ASD in the 16-17 year old group. The results from the younger group of boys with ASD are distributed more evenly with the highest individual in this group having the highest score of all individuals. When comparing the groups with ASD to their non-autistic peers many similarities are observed. The differences revealed in the data analysis suggest gender differences rather than differences between ASD and non-ASD. In figure 3, a larger range of distribution in the results from both groups of girls is noticeable. However, this data must be considered carefully due to the very small sample sizes.
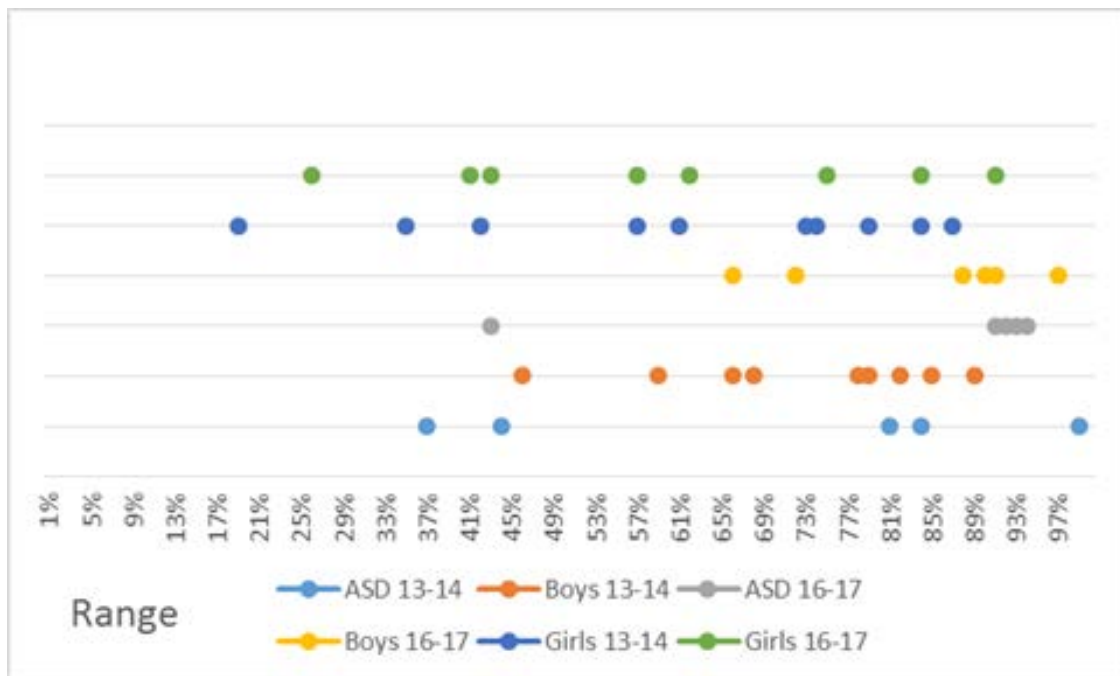

Figure 3: A look at distribution in the combined results of the vocabulary tests

The third research question is aimed at identifying potential causes that might explain the differences found between the young people with autism and their non-autistic peers. Thus the following section was set up to address this final research question. Here relationships are explored between the survey questions and the vocabulary scores through calculating correlation. Table 18 was set up to report these results. Of course, it is well known that correlation does not always imply causation (Moore, McCabe & Craig, 2009). Nevertheless, such measurements will be carefully considered in this study. Correlations were calculated with data from each vocabulary test that was included in the final analysis (N=45) with the corresponding data from the survey. Table 18, reports correlations looking specifically at the productive use of English. While table 19 looks at relationships connected to the passive use of English using correlation. It can be observed that highest correlation levels associated with the vocabulary results were found concerning reading frequency, writing frequency and the frequency of commenting in English on YouTube.

Table 18: Correlations looking for factors that may affect lexical vocabulary ability

Productive use of English		
Correlation of the following 2 activities	*r*	*p*
1. Speaking English with friends & vocabulary test scores	0.30	0.04
2. Speaking English with family members & vocabulary test scores	-0.15	0.32
3. Speaking English with parents and vocabulary test scores	0.01	0.93
4. Gaming and vocabulary test scores	0.34	0.02
5. Writing in English and vocabulary test scores	0.49	0.01
6. YouTube usage and vocabulary test scores	0.40	0.01
7. Using English on social media pages (chat, snapchat, fb, twitter) and vocabulary test scores	0.28	0.06
8. Code-switching and vocabulary test scores	0.30	0.04
9. Texting in English and vocabulary test scores	0.24	0.11

Table 19: Correlations looking for factors that may affect lexical vocabulary ability

Passive use of English		
Correlation of the following 2 activities	r	p
10. Reading in English & vocabulary test scores	0.55	0.01
11. Listening to music & vocabulary test scores	0.23	0.12
12. Watching television and movies & vocabulary scores	0.18	0.25
13. Computer usage and vocabulary test scores	0.16	0.31

This chapter reported the results from this triangulation study which compared how young Icelanders with ASD are using English in comparison to their non-autistic peers. In the first part of the study 5 parents of children with ASD, who described their children as preferring English rather than Icelandic, were interviewed. These parents all described their children using English as both a primary and preferred means of communication. Thus, these interviews presented evidence that suggest that new patterns of language development may be emerging among some children with ASD in Iceland. In the second part of the study, a survey about English usage was conducted to study English usage and 2 types of vocabulary tests were used to measure receptive lexical proficiency. The results of the survey revealed 3 significant differences when comparing young Icelanders with ASD to their non-autistic peers. The first difference found that boys with ASD in the age bracket of 13-14 years commented more frequently on YouTube than their age equivalent male peers. The second difference identified that boys with ASD ages 13-14 years rated themselves as significantly less proficient in reading English than their non-autistic peers. The third difference revealed that boys with ASD in the age bracket of 16-17 years reported writing less frequently on social media pages such as chat, skype, snapchat, fb and twitter than their non-autistic male peers. The results of the vocabulary tests did not reveal any significant differences due to ASD, but rather presented evidence for gender differences in receptive lexical proficiency among the students in the age bracket of 16-17 years. All of these results will be further discussed in the next chapter, and the possible implications of these findings will be considered.

5. Discussion

This chapter will begin by looking at the various limitations in this study which are important to have in mind when considering the results. Then the topic will change to look at each of the 3 research questions. This will begin by discussing the differences found in how young Icelanders use English, as was identified in the results of the interviews and also in the survey. Then the focus changes to lexical proficiency. Here the results of both vocabulary tests are reflected upon comparing the students with ASD with their non-autistic peers. Then, the final research question is addressed by discussing the relationships that certain types of English usage might have on vocabulary acquisition. Also the final research question is applied to motivational theories about L2 learning in connection to the findings of the interviews.

When looking at the limitations that this study faces, perhaps the lack of participants has had the most negative and limiting effect on the results of this study. The process of finding young people with ASD and then obtaining parental consent for their participation was often unsuccessful. One other problem encountered when choosing suitable candidates for the older group of participants, was that high functioning students with ASD sometimes enroll into secondary schools without submitting information about their ASD diagnoses. For this study both teachers and counselors within the general education departments of 3 secondary schools were contacted, yet, few participants were found in these attempts despite the cooperation of the school staff. Therefore in part 2 of this study, the older group of students with ASD, ages 16-17 years, consisted mostly of students who attended special education departments within secondary schools. This may have had the effect that higher functioning individuals were not as well represented in this group of students as compared to the younger group of students with ASD ages 13-14 years.

Another potential confounding factor that this study faces is that ASD is a diverse spectrum disorder (World Health Association, 2015). This diversity within ASD itself, as well as other conditions that commonly co-occur with ASD (Levy et al., 2010), make it difficult to attribute which factors might be caused by ASD itself when studying language behavior and language preference. Therefore there are multiple reasons why the data presented in this study should be considered with caution, and the need for further

research is strongly emphasized. As a result, it will not be possible to make any sound conclusions in this study. However regardless of the limitations in this study, the data are potential indictors that should be carefully considered when planning further research in Iceland.

5.1. Research question 1: Indications of differences in English usage

 The results of the interviews, identified 2 patterns of language development that involved descriptions of Icelandic children with ASD choosing to speak English in environments that were traditionally Icelandic. The question that must be considered is whether such language behavior is typical among non-autistic children in Iceland, or are these patterns unique to children with ASD.

        The first pattern of language development identified in these interviews were concerned with preschoolers who were learning English and Icelandic simultaneously. These children were all exposed to Icelandic in their homes and in their preschools. Also these children were passively exposed to English through digital technology. Despite this exposure being passive, the parents described these young children as having clear and strong preferences for speaking English in all domains. This is concerning behavior. However this study must ask whether this is unique behavior for Icelandic children with ASD, or is there evidence that non-autistic preschoolers exhibit the same characteristics? The problem with this part of this study is there is no control group. Plus there are no actual measurements of how English is used. Thus it is difficult to make any conclusion. However, language delays and language impairment are documented characteristics of ASD (World Health Association, 2015) which lead to a different pattern of development and a need for supportive interventions (Mirenda & Iacono, 2009). Therefore, it seems logical that there might be substantial differences in how preschoolers with ASD respond to the overwhelming amount of English in the environment. However, this is not to say that other Icelandic children are not also affected by these same factors. The article discussed in the introduction of this essay by speech therapist, Linda Björk Markusdóttir (April 2015) presents evidence that other children are also affected by the amount of English in their environment. However more research is needed in this area which looks at how frequent these issues are. Unfortunately no sound conclusions can be made about

such a comparison. None the less, these interviews do provide formal documentation of these parental reports which is a beginning step in addressing this issue.

When applying the first research question to the older group of children discussed in the interviews, there is again the same problem with a lack of measurement and no control group. The information obtained in the interviews from the parents described a pattern of language development that differed from the descriptions of the preschoolers. These older children with ASD were described as learning Icelandic as small children. Then in primary school they developed an interest for English that was linked in all cases to personal interests and hobbies. The majority of these children were described as having developed a preference for speaking English in all domains. However, when applying the first research question to this information, it must be asked whether such developmental patterns are also typical in non-autistic children. Thus, due to the lack of a control group, it is again difficult to make a clear comparison. Therefore the results from the interviews with parents of older children with ASD will be addressed and used as a comparison to the findings in the survey. The interviews will be also referred to when looking at potential causes and factors that influence how young Icelanders with ASD use English.

The survey results

Chi-square analyses identified 3 differences in English usage when comparing young Icelanders with ASD to their non-autistic peers. These differences were apparent in the following survey questions:

- How often do you write English comments on YouTube ?
- How often do you write in English on social media pages? (Chat, Skype, Snapchat, Facebook, Twitter)
- How skilled are you in reading English?

The survey question that concerns writing comments on YouTube was added to the survey as suggested by the first participant with ASD who answered the survey. This participant pointed out that the survey question about social media asked only about chat, Snapchat, Twitter, Facebook and Skype and excluded YouTube. This participant claimed that young Icelanders with ASD are not especially active on the social media pages that were listed in the first version of the survey. According to this participant, young people with ASD in Iceland tend to rather be quite active on YouTube. They use YouTube to

post videos in English that are connected to their interests. They also occasionally comment in English on videos posted by others. As a result of the conversation with this first participant about YouTube and social media, a specific question that inquired about the frequency that students post English comments on YouTube was immediately added to the survey. When the results of the survey were calculated with chi-square analysis, it revealed that boys with ASD in the age bracket of 13-14 years more frequently commented in English on YouTube than their non-autistic peers. The information from this first participant also supported the difference found in the chi-square analysis where boys in the age bracket of 16-17 years with ASD reported writing less frequently in English on the social media pages such as Skype, Snapchat, Twitter, and Facebook than their non-autistic peers. Thus, this study may have identified a common online language behavior among young Icelanders with ASD that is different from their peers.

The author continued to talk to the participants with ASD throughout the study and asked them about how they use YouTube. Many of these participants shared that they use YouTube to communicate with others that like to play the same kind of computer games. They often described strategizing with others about their interests in these games through the use of YouTube. One of the individuals in the 13-14 year old group, as well as a young individual from the first part of the study, had their own YouTube channels. Using YouTube in this way appears to be highly motivational because it involves socializing with others that have similar interests and hobbies. It also leads to these individuals using English to discuss these interests. In turn, such activity on YouTube may have a positive effect on vocabulary acquisition. When looking at the correlations calculated for the results, the scores of the vocabulary tests and the frequency of commenting in English on YouTube was calculated to have a positive correlation (r=0.40). Using English on YouTube, as many of these children with ASD do, provides these children with opportunities to practice using English productively.

The other survey question that revealed significant differences through chi-square analysis involved the ability to read in English. The boys 13-14 years rated themselves as significantly less proficient in reading in English in comparison to how their non-autistic peers rated themselves in reading English. Here the participants in the survey had the option of rating their ability to read in English as very good, good, rather poor, or poor.

Because reading comprehension has been identified as a difficult task for many people with ASD (Nation, Clarke Wright & Williams, 2006), one might say these results are very predictable. Therefore these participants might possibly have been aware of weaknesses connected to reading comprehension. One participant in the study commented on his reading comprehension skills by saying in English, "My book memory is terrible".

Difficulties in reading in English were also described by the parents of young people with ASD in the interviews. One of the parents described her child's interest in reading in English as being limited to reading directions for computer games. Another parent described her child as reading only comic books. One more parent simply said that her child had dyslexia. Such difficulties connected to reading comprehension obviously can lead to a lack of motivation connected to reading. Only one of the children discussed in the interviews found reading to be fun. This individual had Asperger Syndrome and was described by her parent as an avid reader who was reading in a curriculum level that was 2 years above her peers. Therefore one must also be careful and not claim that all individuals with ASD have difficulties with reading comprehension. However, for the majority of the older individuals that were discussed in the interviews, reading in both English and Icelandic was described to be more like a chore than a pleasurable activity. Therefore it seems rather predictable that the young people with ASD ages 13-14 might rate themselves as less proficient than their peers in this task. When looking at correlation, reading in English was positively correlated with the results of the vocabulary tests (r=0.55). This supports that reading has a positive effect on lexical proficiency.

5.2. Research question 2: lexical proficiency

When looking at the results regarding lexical proficiency, there were no significant differences found in the results of the analyses that were due to ASD. The differences found in the Mann Whitney U-tests suggest that the differences found were due to gender. However, there are several factors which must be considered and discussed concerning these results.

First, it is important to remember that there were a lack of participants in all of groups in this study. Also, the role ASD might play in the results must be considered. Such effects caused by ASD may be more apparent in the group of participants in the age bracket of 16-17 years, because the majority of these students attended school in special education departments rather than general education programs. When considering this factor, it seems somewhat surprising how well this group performed in comparison to their non-autistic peers. However, there was little distribution in these results. One might speculate what might have been, had this study found more participants with ASD in general education programs. Perhaps these individuals might have also scored somewhat higher than their non-autistic peers, as was the case with the younger group? One can only speculate.

The group of younger participants differed somewhat from the older group with ASD. This younger group consisted of students from general education programs as well as from special education departments. Therefore the younger group of students with ASD may be more representative of the diverse abilities among young Icelanders with ASD. When looking at this younger group of 13-14 years old boys and their range of scores in the vocabulary tests, the overall results are extremely diverse. At one end of the spectrum there was one 14 year old with ASD who was unable to take the vocabulary test due to difficulties with reading and language proficiency. At the other end of the spectrum there was another 14 year old boy who scored 94% correct on the multiple choice test and 100% correct on the yes/no test with marking only 2 non-words. This particular 14 year old with ASD had the highest score of all tests in all groups. There were also 3 other students with ASD in the 13-14 year old group who scored extremely high in these vocabulary tests. The mean of the combined scores of the 13-14 year old group was actually higher than their non-autistic peers, and it was also higher than the older ASD group.

Other factors worth considering are various co-occurring conditions. When looking at the students with ASD who were scoring on the lower end of the vocabulary tests in the younger group, it is notable that several of these students were diagnosed with intellectual disabilities as well as ASD. While the students who scored higher in this study tended to not be diagnosed with intellectual disabilities, but several of these

individuals were diagnosed with co-occurring ADHD. Another student who scored very high had language impairment. A hallmark of language impairment is difficulties in structuring words, phrases and sentences (Rice, Warren & Betz, 2005). Notably, this individual's high score in English vocabulary may support that language impairment does not necessarily limit an individual's ability to learn and recognize vocabulary words. When considering the effects that ASD and co-occurring conditions might have on vocabulary, it is impressive to consider how well all the groups of Icelanders with ASD did in the vocabulary tests. These results support that these differences were not connected to ASD in any of the comparisons. However there were indications of differences that were due to gender. Therefore it seems more appropriate to look at English exposure regarding these differences between girls and boys in the future. In this study the boys reported playing computer games and online gaming more often than the girls. Such exposure to English through computer games may positively affect vocabulary acquisition in both boys with ASD as well as non-autistic boys. Thus it is not accurate to conclude in this study that ASD affects lexical proficiency in English. The conclusion is rather that the participants with ASD had similar levels of lexical proficiency in English as their non-autistic male peers.

5.3. Research question 3: The potential causes of the differences
The reasons for differences in English usage between the participants with ASD and their peers are perhaps more difficult to address, but it is also necessary to try to understand why they exist. When considering the results regarding reading in English, the reason why the boys with ASD found themselves to be less proficient in this activity seems rather predictable. This might be simply because people with ASD often tend to have difficulties with reading comprehension (Nation, Clarke Wright & Williams, 2006). These students might have simply been aware of such difficulties. When considering the fundamental cause for young people with ASD commenting in English frequently on YouTube rather than other forms of social media, the reason for this behavior seems more complicated. However many of the participants stated that YouTube was a method of strategizing and communicating with others about their interests in computer games. Thus,writing on YouTube may be an activity which is fun and motivational. Studies also

support the perception that people with autism both socialize online and tend to frequently play computer games (Davidson, 2008; Mazurek & Wenstrup, 2013; Mazurek, Engelhardt & Clark, 2015).

Furthermore, it is also important to include the results of the interviews in this discussion about cause of differences in the use of English. The developmental patterns and the strong preferences for speaking English described by the parents in the interviews are not issues that should be brushed aside simply because there is no exact measurement of frequency nor an exact comparison regarding these behaviors. Therefore both parts of the study shall be addressed. When looking at the results of the interviews, it is quite apparent that all the participants were described as having strong preferences for speaking in English rather than Icelandic. The parents were asked in the interviews as to what they thought caused their child to prefer speaking English. A list has been made of the factors named by parents as motivating their children to speak English:

1. Their child had attained a sufficient level of English proficiency.
2. Their child had hobbies and personal interests that were strongly connected to English.
3. Their child enjoyed listening to English music on YouTube.
4. Their child learned skills through iPad applications that were in English.
5. Their child received attention from others when speaking English.
6. Their child was occasionally complemented by other Icelanders on their ability to speak English.
7. Their child felt successful and proud of his or her abilities in English.
8. Their child felt equivalent to other Icelandic conversational partners when speaking English.
9. Their child excelled in English at school experiencing academic success.
10. Their child found it easier to express emotion in English.

The parents also described the following factors as discouraging their children from speaking Icelandic:

1. Their child's personal interests and hobbies were not connected to Icelandic.
2. Their child was often corrected by others while speaking Icelandic.

3. Their child experienced themselves as inferior to others when speaking Icelandic.

4. Their child found it difficult to express emotion while speaking Icelandic.

5. There is a lack of Icelandic music and videos on YouTube that interest their child.

6. There is a lack of Icelandic used in computer games and iPad applications.

These explanations from the parents suggest that these children with ASD at times have encountered criticism regarding their abilities in Icelandic. In the theoretical chapter, it was noted that Icelandic language policy is well known for its purist nature (Kvaran, 2004). Therefore one might question how such views affect the experiences of children with ASD who are struggling with general communication, and may not always use language in the typical manner. Experiencing criticism for one's skills in one's own native language do not contribute to a positive self-image. Hopefully in the future people will become more aware of this sensitive issue, and educators and others will work towards change. Understandably such negative experiences might cause children to look to other environments or cultures that they find to be more positive and less stressful.

When relating these descriptions of experiencing criticism to L2 motivational theory, the behavior of these children discussed in the interviews seems very predictable. Lambert and Garner's theory (1959) about motivation in second language learning defined the concept, "integrativeness" which was described in the theoretical chapter of this essay as the level of motivation an individual has to integrate with other cultures. The children with ASD discussed in the interviews may have had a very high level of motivation to integrate with another culture than their own Icelandic culture. Correspondingly, Gardner and Lambert also proposed in their theory that individuals who do not have favorable attitudes towards their own cultures are more likely to seek out or integrate with other cultures. As described in the interviews, these children with ASD developed English accents that corresponded with the English speaking cultures that they were most drawn to, and their hobbies and personal interests all involved these foreign English speaking cultures.

The interview results can also be related to the more recent motivational L2 learning theories that focus on "possible selves" as described by Dörnyei (1998). He emphasizes the complexity and multi-faceted nature of the motivation behind second language learning. In the case of the children discussed in the interviews this involves a

complex concoction that blends Icelandic culture, autism culture, personal interests, and hobbies into the self that these individuals desire to become. Dörnyei (2009) emphasizes that how we communicate is a reflection of who we are, and we are most motivated to learn languages that will lead us to become our ideal self. In one of these interviews one of the young Icelander's with ASD was described by his mother as having the goal of becoming American. Considering these descriptions from these parents, one can't help but wonder about the role that autism plays in these situations, and also the role that society is playing in this matter. Does Icelandic society unintentionally exclude individuals that struggle with Icelandic?

Ironically, this study about English usage is now focusing more on Icelandic education than English education. This study must also ask, are students with ASD being included in the language classroom? Also are they educated through the use of methods and materials that are appropriate, effective and motivating? Hawkins and Norton (2009) emphasize these issues about inclusion and exclusion in the language classroom as was discussed in the theoretical chapter. The language classroom is an ideal place to support these individuals and help them discover interesting and positive aspects about their own Icelandic culture.

It is interesting to consider this need for support in regards to two e-mails that were sent to the author of the study while advertising for participants. These e-mails came from parents of students with ASD who also had high levels of anxiety. Both of these parents apologized for their lack of consent and explained that their children with ASD were struggling in school. These children were described as having difficulties with anxiety that were so severe that it affected school attendance. Therefore these parents explained that taking such a survey was too stressful for their children, and they could not give parental consent for participation. Notably, both of these parents also described their children as very proficient and extremely active speakers of English. With this consideration in mind, there maybe a possibility that there was a lack of representation in the survey results of a group of students with ASD that struggle with anxiety, depression and other emotional difficulties.

Also when looking at the differences found in the survey question about YouTube, one must consider the possibility that anxiety may also play a role in this

behavior. Students who frequently are on YouTube are not socializing in person. They are rather socializing online through strategizing and discussing computer games. The tendency for people with ASD to socialize online (Davidson, 2008) was discussed in the theoretical chapter that focused on computer usage among individuals with ASD. Recent research has linked anxiety as a common reason for why people play computer games, and computer games have been described as functioning as a means of escape from reality where one can experience a fantasy world (Mazurek & Wenstrup, 2013, Mazurek, Engelhardt & Clark, 2015). This possible connection between ASD, computer games, YouTube, anxiety and English is all an interesting speculation. Autism imposes daily challenges on individuals which may lead to anxiety, and anxiety may lead to computer usage, gaming and socializing on YouTube about one's interests in computer games. In turn, these individuals with ASD are exposed to a great deal of English vocabulary and may even find stress relief and acceptance in this online culture that does not exist in their native tongue.

6. Conclusion

This triangular study was set up using mixed methods to look at how young Icelanders with ASD use English. The study came about in response to anecdotal reports from parents and professionals where young Icelanders with ASD have been reported to have extensive English vocabularies and some of these anecdotal reports have also described these individuals as preferring to speak English rather than their native Icelandic language. The results from the interviews have documented reports that are especially concerning. The preschoolers with ASD were described as most motivated to learn language through iPad applications and YouTube songs that were only available in English. Obviously one must conclude that the type of digital material that interests these young Icelandic children with ASD needs to be studied. Then similar material should be produced in Icelandic to support these preschoolers in attaining proficiency in their native language of Icelandic. The ability to speak one's native language is obviously necessary to become an active participant within one's own culture, and therefore this needs to be emphasized during the preschool years when language is developing.

The interviews with parents reported that older children with ASD had strong preferences for speaking English rather than Icelandic. Several parents described that their children have experienced stress and negativity when speaking Icelandic which contrasted from the praise and positive attention they received when speaking English. Future investigation is needed to look at these issues in more depth. Such research should include developing effective teaching methods that are motivational for children with ASD to support them in becoming proficient and literate in both English and Icelandic. Children with ASD need to be proud of their heritage and find areas of interests that are related to their own culture as well as foreign cultures. In addition emphasis in educational programs for children with ASD in Icelandic need to include interventions designed to reduce anxiety that are research based practices. It is essential that all children have the opportunity to excel in some area in their educational experience.

The results from this study support the findings of other recent studies in Iceland where young Icelanders are often using English productively (Arnbjörnsdóttir, 2015) and many of these young Icelanders are attaining high levels of lexical proficiency (Jóhannsdóttir, 2010). When looking at this study and asking the question, do Icelandic

students with ASD use English differently than their peers, the results of this study support that there are differences. The finding that boys with ASD tend to use YouTube to communicate with one another in English may be a new discovery. Many of the young people with ASD in this study showed the author how they commented on videos posted on YouTube. They also described posting their own videos where they shared their opinions and strategized with others about their interests in computer games. This discovery might be a potential tool for teachers which could provide these students with visual support and a comfortable means of communicating. The results of this study also support that Icelandic young people with ASD are acquiring vocabulary levels that are very similar to their non-autistic peers. However, due the small sample sizes, all the results must be interpreted with reservation. Further research is obviously needed to take a closer and more accurate look at all the issues that were investigated in this study. No concrete conclusions can be made, but the results serve as a first step in understanding how English is used among young Icelanders with ASD.

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Enskunotkun nemenda

Þessi könnun er hluti af MA lokaverkefni í almennum málvísindum við Háskóla Íslands, sem hefur það markmið að skoða hvernig nemendur eru að nota ensku í daglegu lífi. Könnun þessi er nafnlaus og ekki er hægt að rekja svör til einstakra þátttakenda. Fyllsta trúnaðar verður gætt gagnvart öllum þátttakendum.

Bakgrunnspurningar
(Svarið eftir bestu getu.)

1. Strákur ( ) Stelpa ( )

2.

Fæðingarland mitt er :_____

Fæðingarland móður minnar er: _____

Fæðingarland föðurs míns er: _____

3. Aldur_____

4. Í hvaða bekk byrjaðir þú að læra ensku?_____

5. Hefur þú dvalið í enskumælandi landi (Bandaríkin, Bretland, Ástralía, Suður

Afrika o.s.frv. lengur en einn mánuð)?

   A. Já ( ) Nei ( )

   B. Hversu lengi?_____

   C. Hversu gamall / gömul varstu?_____

Viðhorf mitt gagnvart íslensku og ensku tímum í skólanum:

	Jákvætt	frekar jákvætt	alveg sama	frekar neikvætt	neikvætt
Íslensku tímum					
Ensku tímum					

Spurningar um færni í ensku:

	mjög fær	fær	frekar fær	ekki fær
Hversu fær ertu í að skilja enskumælandi fólk?				
Hversu fær ertu í að tala ensku?				
Hversu fær ertu í að lesa ensku?				
Hversu fær ertu í að skrifa ensku?				

Spurningar um tungumálnotkun:

	Á hverjum degi	5-6 daga í viku	3-4 daga í viku	1-2 daga í viku	Aldrei
1. Hversu oft lestu þér til skemmtunar á ensku?					
2. Hversu oft lestu þér til skemmtunar á íslensku?					
3. Hversu oft hlustarðu á tónlist á ensku?					
4. Hversu oft horfir þú á sjónvarpsefni eða bíómyndir á ensku?					
5. Hversu oft spilar þú tölvuleiki á ensku?					
6. Hversu oft áttu samskipti á ensku við aðra leikmenn ef/þegar þú spilar tölvuleiki á netinu?					
7. Hversu oft talar þú ensku við vini þína?					
8. Hversu oft sendir þú SMS á ensku?					
9. Hversu oft "kommenterar" þú á youtube á ensku?					
10. Hversu oft talar þú ensku við foreldra þína?					
11. Hversu oft talar þú ensku við aðra í fjölskyldunni heldur en foreldra þína? (t.d. systkyni)					
12. Hversu oft skrifar þú ensku?					
13. Hversu oft notar þú ensku á samfélagsvefum (chat, Skype snapchat, Facebook, Twitter)					
14.Blandar þú enskum orðum eða enskum setningum saman við íslensku þegar þú ert að tala?					

Merktu við orðið ef þú þekkir það og getur notað í ensku máli?

1 ☐ cliff	2 ☐ obey	3 ☐ thirsty	4 ☐ galpin
5 ☐ position	6 ☐ overcoat	7 ☐ advance	8 ☐ adair
9 ☐ expect	10 ☐ glandle	11 ☐ system	12 ☐ interval
13 ☐ large	14 ☐ accident	15 ☐ needle	16 ☐ structure
17 ☐ indicate	18 ☐ stream	19 ☐ typist	20 ☐ jarvis
21 ☐ rudge	22 ☐ impulse	23 ☐ shine	24 ☐ museum
25 ☐ common	26 ☐ complicate	27 ☐ twose	28 ☐ prefer
29 ☐ suggest	30 ☐ door	31 ☐ destruction	32 ☐ amuse
33 ☐ military	34 ☐ debt	35 ☐ peculiar	36 ☐ method
37 ☐ generous	38 ☐ organise	39 ☐ overcome	40 ☐ cambule
41 ☐ check in	42 ☐ pauling	43 ☐ generate	44 ☐ heap
45 ☐ majority	46 ☐ law	47 ☐ dozen	48 ☐ compose
49 ☐ fountain	50 ☐ sadly	51 ☐ investigate	52 ☐ sandy
53 ☐ vickery	54 ☐ fast	55 ☐ pocock	56 ☐ route
57 ☐ club	58 ☐ population	59 ☐ seize	60 ☐ eckett
61 ☐ impress	62 ☐ accuse	63 ☐ persuade	64 ☐ undertake
65 ☐ remedy	66 ☐ useful	67 ☐ grow	68 ☐ hold
69 ☐ aistrope	70 ☐ red	71 ☐ cure	72 ☐ eldred
73 ☐ mystery	74 ☐ theory	75 ☐ plate	76 ☐ reward
77 ☐ pull	78 ☐ carry out	79 ☐ protect	80 ☐ love
81 ☐ suddery	82 ☐ enough	83 ☐ handkerchief	84 ☐ grip
85 ☐ father	86 ☐ exist	87 ☐ bath	88 ☐ birth
89 ☐ puzzle	90 ☐ succeed	91 ☐ batcock	92 ☐ enter
93 ☐ contact	94 ☐ moffat	95 ☐ warm	96 ☐ song
97 ☐ apartment	98 ☐ descript	99 ☐ leisure	100 ☐ though
101 ☐ christian	102 ☐ free	103 ☐ vertical	104 ☐ speed
105 ☐ dowrick	106 ☐ border	107 ☐ provision	108 ☐ venn
109 ☐ benefit	110 ☐ guess	111 ☐ attach	112 ☐ criminal
113 ☐ aim	114 ☐ oxylate	115 ☐ sale	116 ☐ vital
117 ☐ whitrow	118 ☐ sight	119 ☐ staircase	120 ☐ cage

1. SOLDIER: He is a **soldier.** a. ( ) person in business b. ( ) student c. ( ) person who uses metal d. ( ) person in the army	2. STONE: He sat on a **stone.** a. ( ) hard thing b. ( ) kind of a chair c. ( ) soft thing on the floor d. ( ) part of a tree
3. UPSET: I am **upset** a. ( ) tired b. ( ) famous c. ( ) rich d. ( ) unhappy	4 CANDID: Please be **candid.** a. ( ) be careful b. ( ) show sympathy c. ( ) show fairness to both sides d. ( ) say what you really think
5. SCRUB: He is **scrubbing** it. a. ( ) cutting shallow lines into it b. ( ) repairing it c. ( ) rubbing it hard to clean it d. ( ) drawing simple pictures of it	6. PERIOD: It was a difficult **period.** a. ( ) question b. ( ) time c. ( ) hours d. ( ) friends
7. SEE: They **saw** it a. ( ) cut b. ( ) waited for c. ( ) looked at d. ( ) started	8. LATTER: I agree with the **latter.** a. ( ) man from the church b. ( ) reason given c. ( ) last one d. ( ) answer
9. FIGURE; Is this the right **figur**e? a. ( ) answer b. ( ) place c. ( ) time d. ( ) number	10 TUMMY: Look at my **tummy** a. ( ) cloth to cover the head b. ( ) stomach c. ( ) small furry animal d. ( ) thumb

11. COMPOUND: They made a new **compound.** a. ( ) agreement b. ( ) thing made of two or more parts c. ( ) group of people forming a business d. ( ) guess based on past experiences.	12. Restore: It has been **restored.** a. ( ) said again b. ( ) given to a different person c. ( ) given a lower price d. ( ) made like new again.
13. JUG: He was holding a **jug.** a. ( ) a container for pouring liquids b. ( ) an informal discussion c. ( ) a soft cap d. ( ) a weapon that explodes	14 DRAWER: The **drawer** was empty a. ( ) sliding box b. ( ) place where cars are kept c. ( ) cupboard to keep things cold d. ( ) animal house
15 MAINTAIN: Can they **maintain** it? a. ( ) keep it as it is b. ( ) make it larger c. ( ) get a better one than it d. ( ) get it	16 TIME: They have a lot of **time.** a. ( ) money b. ( ) food c. ( ) hours d. ( ) friends
Takk fyrir! :-)	

Appendix B: The vocabulary test results for individual words

(Frequency level 1)
Percentage of correct answers for each word in vocabulary test

	Words tested	ASD students	Non-autistic students
1	bath	100,00%	94,12%
2	birth	100,00%	85,29%
3	door	100,00%	100,00%
4	expect	100,00%	82,35%
5	father	100,00%	94,12%
6	free	100,00%	100,00%
7	large	100,00%	88,24%
8	love	100,00%	100,00%
9	pull	100,00%	85,29%
10	red	100,00%	100,00%
11	song	100,00%	100,00%
12	speed	100,00%	94,12%
13	warm	100,00%	94,12%
14	christian	90,91%	76,47%
15	common	90,91%	82,35%
16	enough	90,91%	91,18%
17	grow	90,91%	97,06%
18	hold	90,91%	97,06%
19	plate	90,91%	91,18%
20	shine	90,91%	85,29%
21	thirsty	90,91%	91,18%
22	accident	81,82%	82,35%
23	sadly	81,82%	82,35%
24	succeed	81,82%	73,53%
25	obey	72,73%	58,82%
M		93,82%	89,06%

(Frequency level 2)
Percentage of correct answers for each word in vocabulary test

	Words tested	ASD students	Non-autistic students
1	club	100,00%	100,00%
2	fast	100,00%	97,06%
3	needle	90,91%	64,71%
4	population	90,91%	88,24%
5	advance	81,82%	70,59%
6	contact	81,82%	94,12%
7	protect	81,82%	73,53%
8	suggest	81,82%	70,59%
9	vertical	81,82%	35,29%
10	carry out	72,73%	85,29%
11	destruction	72,73%	61,76%
12	investigate	72,73%	70,59%
13	route	72,73%	41,18%
14	undertake	72,73%	55,88%
15	attach	63,64%	58,82%
16	benefit	63,64%	58,82%
17	compose	63,64%	58,82%
18	generate	63,64%	55,88%
19	impulse	63,64%	29,41%
20	indicate	63,64%	44,12%
21	descript	45,45%	50,00%
22	debt	45,45%	38,24%
23	leisure	45,45%	14,71%
24	peculiar	36,36%	14,71%
25	seize	36,36%	26,47%
M		69,82%	58,35%

(Frequency level 3)
Percentage of correct answers for each word in vocabulary test

	Words tested	ASD students	Non-autistic students
1	check in	100,00%	94,12%
2	guess	100,00%	85,29%
3	museum	100,00%	88,24%
4	cage	90,91%	70,59%
5	criminal	90,91%	88,24%
6	position	90,91%	64,71%
7	stream	90,91%	85,29%
8	system	90,91%	94,12%
9	sale	81,82%	97,06%
10	aim	81,82%	58,82%
11	cliff	81,82%	73,53%
12	enter	81,82%	94,12%
13	generous	81,82%	70,59%
14	law	81,82%	91,18%
15	reward	81,82%	73,53%
16	sight	81,82%	76,47%
17	useful	81,82%	88,24%
18	amuse	72,73%	52,94%
19	fountain	72,73%	58,82%
20	organise	72,73%	67,65%
21	prefer	72,73%	55,88%
22	though	72,73%	85,29%
23	handkerchief	63,64%	14,71%
24	method	54,55%	58,82%
25	persuade	45,45%	14,71%
M		80,73%	72,12%

(Frequency level 4)
Percentage of correct answers for each word in vocabulary tests

	Words tested	ASD students	Non-autistic students
1	mystery	100,00%	79,41%
2	puzzle	100,00%	91,18%
3	exist	90,91%	91,18%
4	cure	81,82%	76,47%
5	military	81,82%	73,53%
6	accuse	72,73%	55,88%
7	apartment	72,73%	76,47%
8	complicate	72,73%	76,47%
9	dozen	72,73%	50,00%
10	grip	72,73%	73,53%
11	impress	72,73%	82,35%
12	majority	72,73%	50,00%
13	overcome	72,73%	73,53%
14	staircase	72,73%	67,65%
15	structure	72,73%	52,94%
16	theory	72,73%	58,82%
17	border	63,64%	73,53%
18	heap	54,55%	17,65%
19	overcoat	54,55%	50,00%
20	provision	54,55%	26,47%
21	sandy	54,55%	61,76%
22	vital	54,55%	26,47%
23	interval	45,45%	20,59%
24	typist	45,45%	14,71%
25	remedy	18,18%	14,71%
M		68,00%	57,41%

Percentage of students who incorrectly marked a non-word

Non-words tested	ASD students	Non-autistic students
1. rudge	27,27%	8,82%
2. vickery	27,27%	5,88%
3. jarvis	18,18%	5,88%
4. cambule	18,18%	0,00%
5. eckett	0,00%	2,94%
6. eldred	9,09%	8,82%
7. venn	0,00%	2,94%
8. aistrope	0,00%	2,94%
9. suddery	0,00%	8,82%
10. dowrick	0,00%	0,00%
11. whitrow	0,00%	8,82%
12. glandle	9,09%	0,00%
13. pauling	0,00%	8,82%
14. moffat	0,00%	2,94%
15 oxylate	0,00%	2,94%
16. twose	0,00%	0,00%
17. pocock	0,00%	0,00%
18. batcock	0,00%	2,94%
19. galpin	0,00%	0,00%
20. adair	0,00%	2,94%
M	5,45%	3,82%

Appendix C: Parental permission letter for ASD group

Kæru foreldrar/forráðamenn   Mosfellsbæ 2. október 2015

Ég heiti Karen Kristín Ralston og er menntaður þroskaþjálfi. Ég er að fara að vinna MA lokaverkefni mitt í almennum málvísindum undir handleiðslu Ásrúnar Jóhannsdóttur aðjunkts viðHugvísindasvið Háskóla Íslands. Markmiðið með lokaverkefni mínu er að skoða ensku notkun hjá íslenskum börnum á einhverfurófinu.

Sem þroskaþjálfi og meistaranemi í almennum málvísindum hef ég orðið vör við að enskunotkun hjá ungu Íslensku fólki á einhverfurófinu hefur fengið töluverða athygli hjá bæði fagfólki og foreldrum. Það virðist vera að að sumir ungir einstaklingar á einhverfurófinu sækja mikið í ensku og kjósa stundum að tala ensku fram yfir móðurmálið sitt. Það er ekki vitað hversu algengt eða óalgengt þetta er. Vegna þess að þetta er efni sem hefur ekki verið skoðað áður er markmið rannsóknarinnar minnar einfaldlega að byrja á að að kanna hvort það sé hægt að greina mun í enskunotkun á milli ungs fólks með einhverfu og samnemenda þeirra sem eru 13-14 ára á grunnskólasvið og 16-17 ára nemendur í framhaldsskóla.
Þetta verður gert með að leggja fyrir stutta könnun og orðaforðapróf í ensku. Það er reiknað með að það taki tæplega eina kennslustund. Þáttakendum með einhverfu verður boðið upp á aðstoð við að svara könnunni og einnig verður boðinn stuðningur í að taka orðaforða prófið. Slík aðstoð verður einstaklingsmiðuð og verður veitt ef einstaklingurinn óskar eftir því eða hefur þörf fyrir.

Rannsóknin hefur verið tilkynnt til Persónuverndar og fengist hefur samþykki fyrir rannsókninni þar. Allar upplýsingar sem safnað verður um þátttakendur verða meðhöndlaðar samkvæmt reglum um trúnað og nafnleynd og farið að íslenskum lögum varðandi persónuvernd, vinnslu og eyðingu frumgagna. Rannsóknargögn verða varðveitt á öruggum stað og gögnunum eytt að rannsókn lokinni. Fyllsta trúnaðar er heitið við þátttakendur rannsóknarinnar. Þegar niðurstöður rannsóknar verða kynntar verður þess gætt að þær verði ekki rekjanlegar til einstakra þátttakenda. Þátttakendum er heimilt að hafna eða hætta við þátttöku í þessari rannsókn hvenær sem er og án nokkurra skilyrða.

Ennfremur hafa skólastjórnendur gefið samþykki sitt fyrir rannsókninni í þeim skólum þar sem að prófin verða lögð fyrir.

Ef einhverjar spurningar vakna varðandi rannsóknina má hafa samband við okkur
Karen Kristín Ralston, netfang: kkr3@hi.is sími 699-7086
Ásrún Jóhannsdóttir netfang: asrunj@hi.is sími 525-4527

Staður_____Dagsetning_____
Ég, _____ (undirskrift foreldris/forráðamanns)
samþykki hér með að barnið mitt _____ taki þátt í rannsókn Karenar.

Appendix D: Parent permission letter for control group

Kæru foreldrar/forráðamenn   Mosfellsbæ X ---2015

Ég heiti Karen Kristín Ralston og er menntaður þroskaþjálfi. Ég er að fara að vinna MA lokaverkefni mitt í almennum málvísindum undir handleiðslu Ásrúnar Jóhannsdóttur aðjunkts við Hugvísindasvið Háskóla Íslands. Markmiðið með lokaverkefni mínu er að skoða ensku notkun hjá íslenskum börnum. Sem þroskaþjálfi í grunnskóla og meistaranemi í almennum málvísindum hef ég orðið vör við að talið er að enskunotkun hjá ungu fólki á Íslandi sé að breytast. Enska er orðin órjúfanlegur hluti af daglegu lífi á Íslandi í dag. Ég tel því mjög mikilvægt að kanna viðhorf og notkun í daglegu lífi hjá börnum okkar.

Þetta verður gert með að leggja fyrir stutta könnun og orðaforðapróf í ensku. Það er reiknað með að það taki tæplega eina kennslustund.

Rannsóknin hefur verið tilkynnt til Persónuverndar og fengist hefur samþykki fyrir rannsókninni þar. Allar upplýsingar sem safnað verður um þátttakendur verða meðhöndlaðar samkvæmt reglum um trúnað og nafnleynd og farið að íslenskum lögum varðandi persónuvernd, vinnslu og eyðingu frumgagna. Rannsóknargögn verða varðveitt á öruggum stað og gögnunum eytt að rannsókn lokinni. Fyllsta trúnaðar er heitið við þátttakendur rannsóknarinnar. Þegar niðurstöður rannsóknar verða kynntar verður þess gætt að þær verði ekki rekjanlegar til einstakra þátttakenda. Þátttakendum er heimilt að hafna eða hætta við þátttöku í þessari rannsókn hvenær sem er og án nokkurra skilyrða.

Ennfremur hafa skólastjórnendur gefið samþykki sitt fyrir rannsókninni í þeim skólum þar sem að prófin verða lögð fyrir.

Ég bið því vinsamlegast um leyfi fyrir að barnið þitt taki þátt í rannsókninni. Ef þú ert samþykk/ur þátttöku þarftu ekkert frekar að gera. Ef þú vilt ekki að barn þitt taki þátt, vinsamlega hafðu samband við mig á netfang kkr3@hi.is eða ritaðu þá nafn þitt hér fyrir neðan og skilaðu bréfinu til kennara eða á skrifstofu skólans sem barnið stundar nám í fyrir xx. xx 2015.

Ef einhverjar spurningar vakna varðandi rannsóknina má hafa samband við okkur
Karen Kristín Ralston, netfang: kkr3@hi.is sími 699-7086
Ásrún Jóhannsdóttir netfang: asrunj@hi.is sími 525-4527

_____
_____

Ég vil **ekki** að barn mitt taki þátt í rannsókninni um enskunotkun hjá börnum.

Skóli: _____

Nafn barns: _____

Undirskrift foreldris/forráðmanns:_____