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TV, Reading, Gaming and Gaining?

A quantitative study on the effects of extramural exposure to authentic English in Norwegian fifteen-year-old L2 learners

Master's thesis in English with Teacher Education

Supervisor: Anne Dahl

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Abstract

This master's thesis describes a quantitative study on how extramural exposure to authentic English input affects language proficiency. The aim of the study was to investigate how extramural engagement in the activities reading, watching tv, movies and videos on the internet and playing videogames influence language proficiency with receptive vocabulary size chosen as proxy for language proficiency. The study was conducted on 103 15-year-old students attending their final year of obligatory education. The study was carried out as a cross-sectional quasi-experiment, where the participants filled out a questionnaire about their extramural habits and were subjected to the Vocabulary Size Test to measure their receptive vocabulary size. The data from the questionnaire and the vocabulary test was estimated using an ordinary least squares regression analysis. Overall, the study found that reading, playing multiplayer videogames and watching audiovisual media with English subtitles or without subtitles were the biggest predictors of language proficiency in that order for the participants as a whole. However, a significant gender effect was found for the multiplayer gaming variable. The results showed that the highest predictor of language proficiency was multiplayer gaming for the male part of the sample. The study also found a significant curved linear relationship between multiplayer gaming and vocabulary size, meaning that vocabulary size is positively affected by multiplayer gaming until a certain point where it stagnates and starts to decline. In regard to singleplayer gaming, the study found no statistically significant relationship between playing singleplayer videogames and vocabulary size. Lastly, the study found that watching audiovisual media with Norwegian subtitles had a significant negative impact on vocabulary size.

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One would be forgiven the assumption that the ideal time for writing a master's thesis would be during a global pandemic, where one is required to stay at home. However, let me assure you that this is not the case. The process was in no way aided by the added stress of a global health crisis. Nevertheless, I pulled through and have finished perhaps the most laborious task of my entire life. Something which fills me with both pride and relief. Having said that, there are a number of people who deserve my deepest gratitude for their help with my work on this thesis.

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1.0 Introduction

Norwegian 15-year-olds attending their tenth and final year of their obligatory education have received 10 years of English instruction. This extensive English education might be the reason why Norwegians in general are known to be competent speakers of English (Bonnet, 2004; Education First, 2020). However, research in second language acquisition agree that L2 learners must be exposed to large amounts of input to ensure successful language acquisition (Schmitt, 2008). The exact amount of input necessary for successful language acquisition is not known, although, it is likely more than would be possible through formal education alone. Therefore, a possible explanation for Norwegians' English proficiency might be the amount of English exposure we get through our daily lives. Norwegians are generally surrounded by English. Movies and TV-shows aimed at teenagers and adults are shown in their original language, which is often English, either with Norwegian subtitles or without subtitles entirely. Music with English lyrics is as popular, if not more so, than music with Norwegian lyrics. Books written by English or American authors are usually easily accessible in their original language and media content produced by English-speakers is often consumed through social media platforms such as Instagram, Reddit, Tiktok etc. This suggests that Norwegians have ample opportunity for language learning in addition to their extensive English education. However, how strong of an effect extramural habits have on Norwegian 15-year-olds is not precisely known, as there has been little research on the topic in Norway, other than some studies focusing on older L2 learners (Brevik, 2016, 2019; Busby, 2021).

The aim of this study is to examine and uncover the potential effects extramural activities such as watching TV, movies and videos on the internet, playing videogames and reading have on Norwegian 15-year-olds. The current study is a quantitative quasi-experiment on 103 Norwegian 15-year-olds, where the participants were tested on their language proficiency, with receptive vocabulary size chosen as proxy for language proficiency, and filled out a questionnaire asking about their daily habits. The results of the experiment were estimated using an ordinary least squares regression analysis. The present thesis will begin with a presentation of relevant sources and theories related to English knowledge in the world and in Norway, second language acquisition and previous research on how reading, watching audiovisual media content and playing videogames have been found to affect language proficiency. Next, the method used in the study is explained, focusing mostly on the participants, the Vocabulary Size test and the questionnaire. After that, the results and analysis

are presented with the main findings in the study. Finally, the findings of the study are discussed in light of theories and previous research and a conclusion is drawn based on these findings.

2.0 Theory

2.1 English as a global language

Considering the increasing globalization over the last few centuries and especially after the Second World War, the world has also needed a lingua franca to serve as a tool of communication across borders and between nations and cultures (Lysandrou & Lysandrou, 2003). English has come to serve this purpose. It is unclear exactly how many people master English. It will undoubtedly vary depending on the definition of “mastery”. Nevertheless, the number of English users can be placed around 2 billion or a quarter of the world’s population (Lysandrou & Lysandrou, 2003; Strevens, 1992), and the number of speakers has surely grown since 1992 and 2003, with Lysandrou and Lysandrou’s (2003) prediction that the number of English speakers would be expected to swell to a third of the world’s population within the next few decades. Indeed, English is the world’s most widely studied second language and the number of L2 speakers of English far outnumber the native English speakers. There are, for example, more speakers of English in India than there are in Britain (Altbach, 2007). In many countries learning English is seen as a prerequisite to success and knowing English would open the proverbial professional doors that would otherwise be closed to non-speakers of English (Berns et al., 2007).

2.2 The rise of English as a global language

Strevens (1992) outlines how English became a global language in five stages. The three first stages stretched from the 12th century to the start of the 20th century. These stages outline the spread of the English language through exploration, trade and occupation which led to the establishment of trade and settlement colonies all over the world, controlled by the British Empire. In short terms, English spread and established itself as a lingua franca during this time through a combination of necessity (often for malevolent reasons) for indigenous people and immigrants in the colonies to learn English. Additionally, influence from English speaking settlers who often served the role of a ruling class contributed to the adoption of English as a

lingua franca in many colonies. Over time many of the settler colonies rebelled and the non-settler colonies were emancipated, and yet the English language usually remained as an official language of the previous colonies (Strevens, 1992; Kaplan, 2001).

The fourth stage took place between 1900 and 1950, when the British colonies established schools and offered English education and other education, in English, to the indigenous population in the colonies (Strevens, 1992). Furthermore, English also assumed a strong presence especially in Europe during this period, when the United States established itself as a world power and played an essential part in the ending of the First World War. This led the Peace Treaty of Versailles to be written in English as well as French, breaking a long tradition of using French as the sole language of diplomacy (Berns et al., 2007).

The last stage mentioned by Strevens (1992) covers the period between the end of the Second World War and the present. There are many different routes one can take to explore how English ended up as the global language after WW2. Four such routes will be explored herein. Firstly, after the Second World War, most of the remaining British colonies broke away from Britain and formed their own sovereign states. However, English still played an important role in these former colonies, albeit a different one. English went from being a language of subservience to serving other purposes such as being “ ‘a window on the world of science and technology’ or as the only language not rejected by one section of the population or another.” (Strevens, 1992, p. 30). As such it became the or one of the official languages in many of the former colonies. In fact, more than 70 countries recognize English as an official language (Altbach, 2007). Secondly, after the Second World War, The United States was the only Western power whose educational and scientific infrastructure remained completely intact, as the US mainland had been completely untouched during the war. Because of this, the vast majority of research was conducted and written in English in the years following the war, establishing English as the predominant language for science and education (Kaplan, 2001). This also coincided with the birth of the computer age, meaning that the research done in the field of computer science was conducted entirely in English and thus scientists and students within this field from other countries would have to master English to access much needed previous research (Kaplan, 2001). Thirdly, there were several events and coincidences occurring that furthered the establishment of English as a global language. One such was the international agreement to adopt English as the standard for air-traffic control. Another was the establishment of several world organizations like the United Nations (UN), The European Union (EU) and the World Health Organization (WHO) and the use of English within these organizations (Strevens, 1992). Lastly, English became the most prominent language used after

the telecommunication revolution, as English was and still is the most used language in international media, radio, TV, magazines and newspapers (Strevens, 1992). In tandem with, or perhaps because of, these four changes after the world war, many countries introduced educational reform, where English became more prominent in compulsory education. For example, Before the 1970s English education in Germany had been reserved for the most “able”. However, during the 1970s, Germany allotted English a larger role in the education of all children equally. In the same manner, the Netherlands introduced English as a compulsory subject for the last two years of primary education during the 1980s (Berns et al., 2007). It is evident that there were a myriad of different reasons, events and coincidences that led to English becoming a global language.

Today, English truly is a global language. Many languages have previously acted as a lingua franca between people of different nationalities, such as Latin, Greek, Arabic or Sanskrit (Galloway & Rose, 2015), but the scale and use of English is unlike anything that has come before it (Mauranen, Hynninen & Ranta, 2010). Using English often has nothing to do with one’s nationality or one’s country of origins (Strevens, 1992) and English is often the primary means of communication for people from different countries around the globe, regardless of their mother tongue (Berns et al., 2007). Furthermore, English is the dominant lingua franca within the academia (Mauranen, Hynninen & Ranta, 2010; Altbach, 2007) and it is the most taught foreign language in the world (Coulmas, 2005). English also often serves as the default language in international diplomacy, with English playing an official or working role in the affairs of most major political gatherings, such as the United Nations, the Association of South East Nations and the European Union (Galloway & Rose, 2015). In many places, mastering English is viewed as gateway to opportunity and studies have found correlation between higher proficiency in English and higher wages (Tainer, 1988)

2.2 English in Norway

English has had an important role in Norwegian education for a long time. It was first introduced in the national curriculum in 1936. However, this school reform did not make it compulsory for schools to offer their students English lessons. Instead, it was up to each individual municipality whether or not they wanted to offer an English education to their citizens. In 1969, English eventually became an obligatory subject for all students in Norway (Simensen, 2014) and since then the attention on English education has only increased. From the Education reform in 1997, Norwegian school children have started receiving English

instruction from their first year of primary school at age 6 (Norwegian Ministry of Education and Research, 2004). In other words, the children begin receiving instruction in English at the same time as they start receiving formal instruction in Norwegian. English is by far the most important foreign language taught in Norwegian schools. With 138 hours of English instruction from grades 1-4, 228 hours from grades 5-7 and 222 hours from grades 8-10 (Utdanningsdirektoratet, 2020), the focus on English in the Norwegian curriculum is unprecedented in contrast to other foreign language instruction, such as Spanish, German or French which are only optional subjects in grades 8-10. Additionally, to highlight the significant role of English in Norway, it should be noted that the curriculum does not even define English as a foreign language.

The English language is present virtually everywhere in Norway. Most movies and TV-series aimed at teenagers or adults are portrayed in their original language which is usually English, with Norwegian subtitles. Books published by English authors are easily obtainable in their original language and music in English are just as common, if not more so, on the radio as Norwegian songs. Moreover, many Norwegian teenagers are also exposed to English through social media and/or video gaming (Brevik, 2016; Rindal, 2013, 2014; Simensen, 2014). In fact, the English language is so present in Norway that it is, by many, considered a second language, rather than a foreign one (Brevik, 2015; Graddol, 2007; Rindal, 2013, 2014). Indeed, any traveler arriving in Norway would find that most Norwegians speak English with confidence and fluency and Norwegians particularly have a strong reputation for English proficiency (Bonnet, 2004; Education First, 2020).

2.3 Second language acquisition

The central question to anyone studying second language acquisition is “How does one acquire a second language?”. There is little doubt that humans have some ability that enable us to learn language which is specific to humans, something that sets us apart from all other animals, that allows us to both produce and understand both verbal and non-verbal speech with incredible speed. This ability will henceforth be referred to as the language learning ability. One interesting aspect of the language learning ability is the connection between the language learning ability, first language (L1) acquisition and second language (L2) acquisition. There is no doubt that humans have some ability to not only produce and understand language, but also to acquire language. This is apparent from the remarkably effortless way toddlers, babies and

children learn their native language simply by being exposed to it (Meisel, 2011). For L2 learners on the other hand, the process of becoming proficient in a language is not that easy. Anyone who has learnt a second language as a student or an adult would know that acquiring a second language is an arduous process involving tutoring (in many cases), memorization of words and grammatical rules, exposure to the language and practice using it. Furthermore, even after all this, the L2 learner will usually never reach the same level of proficiency as even a native speaking child (Meisel, 2011). In this sense, one of the key differences between L1 and L2 acquisition is variability. Where L1 is almost invariably successful, L2 is characterized by individual differences in outcome. One central question facing L2 researchers is thus what happens to our language learning ability? Considering the fact that the effortless acquisition of language found in children is not limited to one language, as proven by bilingual children (Meisel, 2011), one might think that age is an important factor and that the reason why children pick up language so easily, where adults struggle, might be that there is a finite period of development where language acquisition comes naturally. This might be the reason why the critical period hypothesis first presented by Penfield and Roberts (1959) and later built upon by Lenneberg (1967) received so much attention. In short, the Critical Period Hypothesis explained the “the earlier, the better” view on language acquisition with a theory that argued for a critical period for language acquisition that ended in puberty. In other words, they argued that any L2 learner starting after puberty would never be able to achieve native-like proficiency in their second language (Scovel, 2000). Although, the Critical Period Hypothesis received much attention, it has later mostly been disproven and the research agree that there is no definite critical period for language acquisition (Scovel, 2000; Hakuta, Bialystok, & Wiley, 2003). Having said that, the research still shows that age does have some impact on the success of L2 acquisition (see Scovel, 2000 for a review of the research on the Critical Period hypothesis). This might be the reasons why so many school reforms, also in Norway, have included starting English instruction at an earlier age (Simensen, 2014).

2.4 The importance of input in second language acquisition

There are certainly many factors affecting second language acquisition, and while there is no consensus on the relative importance of all factors, input is undoubtedly a crucial one.

One of the most influential theories on second language acquisition was proposed and further developed by Stephen Krashen in a series of publications (Krashen, 1981; 1982; 1985; Krashen

& Terrell, 1988). Krashen's theory on second language acquisition was presented as a model called *Krashen's Monitor Model* and consisted of five hypotheses on how humans acquire a second language. Of these 5 hypotheses, three are of special concern for this study. The first hypothesis of special concern here is *the acquisition-learning hypothesis*. This hypothesis posits that humans develop competence in a second language mainly through acquisition in response to input, while learning is a peripheral and non-crucial part of language acquisition (Krashen, 1982). *Acquisition* refers here to the subconscious and implicit process of acquiring language through a focus on communication and use. In other words, Krashen believed that adults still have access to the "language acquisition device" of children. In this regard, Krashen opposed the *critical period hypothesis* mentioned above. *Learning* refers to the explicit and intentional process of learning about and knowing the rules and grammar in the target language. According to Krashen, the two processes, *learning* and *acquisition*, are totally separate and distinct systems with no interface (Krashen & Terrell, 1988).

The second hypothesis of special concern here is *the monitor hypothesis*. This hypothesis is closely related to the *acquisition-learning hypothesis*, in that it argues that the *acquisition* system and the *learning* system serve different purposes. According to Krashen, all language competence and the means of acquiring and producing a second language is a result of the *acquisition* system, while the *learner* system's function is to monitor the language use, make correction and change output (Krashen, 1982). In this way, Krashen argues that the ability to use language is solely derived from the learner's acquired competence (Liu, 2015).

The third hypothesis of special concern here is *the input hypothesis*. This hypothesis is perhaps the most important of the hypotheses in *Krashen's Monitor Model*, as it attempts to explain how language is acquired. Krashen argues that language is only acquired through exposure to and interaction with comprehensible input. By this he means that humans learn language by focusing on communication and the message, rather than the form of the input and that we learn by being exposed to input slightly higher than our current language proficiency. This has been demonstrated in the formula "i+1", where "i" is the current proficiency level of the learner, while "+1" is the step above, comprehensible input is thus the core of the hypothesis (Krashen, 1985).

Krashen's monitor model has been quite heavily criticized and has caused much controversy within the second language acquisition (SLA) field (see Lei & Wei, 2019 and Liu, 2015 for reviews on Krashen's monitor model). However, despite the criticism garnered by the *Monitor Model*, the theory has still contributed a lot to the SLA field. Firstly, the model and especially the *input-hypothesis*, has been praised for how it has influenced the language

teaching methodology. Based on the hypothesis, the focus on input and exposure to input has received more attention in L2 classrooms. In other words, the model led to a shift in attention in L2 acquisition research that resulted in a consensus that exposure to authentic input of the target language is crucial for successful language acquisition. Additionally, more attention has been given to the message in communication, rather than the form, thus shifting the focus away from the rule- and grammar-based instruction towards a communicative language teaching (White, 1987; McLaughlin, 1987; Brown, 2000). Furthermore, the research agrees with the need to challenge L2 learners with input slightly above their level. However exactly what this would entail would likely be different from instance to instance (White, 1987; Brown, 2000).

Following Krashen's *Model Monitor* and especially the *input hypothesis* several theories have been put forward focusing on the importance of input for successful language acquisition. One these hypothesis is the *interaction hypothesis* (Gass & Mackey, 2006). In short, the *interaction hypothesis* argues that language learning takes place through a complex process of input, output and interaction. In regard to input, Gass (2003) separates input into negative and positive evidence. Positive evidence refers to the input of well-formed sentences learners are exposed to. This may come from exposure to the language through different forms of media, such as TV, reading, listening to music etc. or through interacting with other speakers of the target language. From these inputs, the learners have a direct opportunity to form linguistic hypothesis. Negative evidence refers to the type of input that provides learners with the information on the incorrectness of utterances. Negative input may be pre-emptive or reactive. Pre-emptive refers to input before an error occurs, such as formal or informal instruction, while reactive negative evidence refers to reactions to an already occurred error. Gass (2003) goes on to argue that positive evidence is "[...] the most obviously necessary requirement for learning" (p. 226), while it is less clear to what extent negative evidence influence learning. Regardless, input is considered to be vital for successful L2 acquisition in the *interaction hypothesis*, and in fact all theories of second language acquisition recognize this (Gass & Mackey, 2006).

2.5 Vocabulary acquisition

There's no doubt that becoming proficient in any language is a many-faceted process that requires competence in several areas. Indeed, testing proficiency in a way that would result in a complete indication of the participant's English proficiency would be a complicated and far too comprehensive endeavor for many studies done on language proficiency. Therefore, a proxy

for language proficiency is often chosen. A proxy that is often used for language proficiency is vocabulary size (e.g. Neuman & Koskinen, 1992; Koolstra & Beentjes, 1999; Rodgers, 2013). Arguably, vocabulary can be considered a very good proxy for language proficiency, as it is vitally important for most language use and vocabulary acquisition is also one of the most challenging aspects of second language acquisition (Schmitt, 2008).

Naturally, this leads to the question of how large vocabulary one must have to be considered proficient in a language. Nation (2001) states that there are three kinds of information that may help to decide how large one's vocabulary needs to be: "the number of words in the language, the number of words known by native speakers and the number of words needed to use the language" (Nation, 2001, p. 6).

Firstly, determining how many words there are in the English language is no easy task. Should homographs be counted as one word or two or should words with the same root, but different affixes be counted as one word? Because of these challenges, linguists often use the term *word families* which "consists of a headword, its inflected forms, and its closely related derived forms" (Nation, 2001, p. 8). Based on the definition of vocabulary knowledge as the "knowledge of word families" one can set a goal to learn all the word families in English. This however does not seem like a viable option. For one because even using the definition of word families, the total number of words still differs with one study finding 114,000 word families (Goulden, Nation & Read, 1990) and another finding 88,500 (Nagy & Anderson, 1984). Secondly, not even native speakers of English know all word families in their language, as there are numerous technical, academic and field specific terms that most people do not know.

Secondly, how many words are known by a native speaker?. Nation (2006) argues that, despite a long history of research within in this area, the methodology has often been faulty. However, the more conservative estimates, done using sound methodology, put the vocabulary knowledge of well-educated native English speakers at around 20,000 word families. More recently Brysbaert, Stevens, Mander and Keuleers (2016) found that native American-English eighteen-year-olds on average have a knowledge of 11,100-word families. However, setting the goal for acquisition to having the vocabulary knowledge of the average native speaker may be an ambitious goal. Indeed, knowledge of the vocabulary size of the average native does not tell us anything about what is needed in order to use the language.

Thirdly, how many words must one know in order to use the language? Nations (2006) found that in general a knowledge of the most frequent 8,000-9,000 word-families would be sufficient to understand 98% of written text and knowledge of the 6,000-7,000 most frequent word-families is sufficient to understand 98% of spoken input. For understanding spoken input

in movies and TV-shows other studies have similarly found that knowledge of the 3,000 most frequent word-families is sufficient for 95% comprehension and knowledge of the 6,000 most common word-families is required for 98% comprehension, with some variance between 2,000-4,000 word-families for 95% comprehension and between 5,000-9,000 for 98% depending on the genre (Webb & Rogers, 2009a; Webb & Rogers, 2009b). This may have some implications for L2 learners considering research has shown that understanding 98% of the words in written or spoken input is considered to be required for unassisted language comprehension (Hu & Nation, 2000).

As an L2 learner of English, it is certainly possible to attain the vocabulary knowledge sufficient for 98% comprehension required to read and listen to authentic English effortlessly, without pausing to look up words. For instance, Busby (2021) found that almost 60% of the Norwegian students studying English mastered the ten-thousand level on the Vocabulary Levels Test (Schmitt, Schmitt & Clapham, 2001) and would therefore have a large enough vocabulary for 98% comprehension. This is, however, as we have seen above, not done without difficulty as there are thousands of individual words as well as their many inflections and derivations one needs to learn. It seems thus quite obvious that formal education alone is not sufficient to provide this level of vocabulary knowledge. Consider the Norwegian 15-year-olds, who have had a relatively large amount of English instruction throughout their obligatory education. During their 10 years of education, they receive 593 hours of English instruction (Utdanningsdirektoratet, 2010). If formal education was their only source of English learning, they would have had to learn an average of about 14 new word families during each and every one of those hours in order to reach the vocabulary necessary for 98% comprehension of written text. Considering that vocabulary learning is just one part of the curriculum in English, together with learning grammar, history, writing, literature, culture etc., it goes without saying that learning English solely through formal education is not sufficient to attain the vocabulary needed to read, write and speak English. Having said that, one would not necessarily expect a 15-year-old L2 learner to be on the level of 98% comprehension. Nevertheless, the point still stands if 95% comprehension was the goal. The formal education alone would still not be sufficient.

2.6 Incidental word learning

It seems evident that an L2 learner of English would have to supplement their formal education with input and exposure to authentic English outside of the classroom in order to achieve the vocabulary necessary for independent use. In fact, the research agrees that English instruction alone is not sufficient to achieve competence in English (Bybee & Hopper, 2001; Ellis, 2002; Ellis & Wulff, 2014). The language learning that takes place while being exposed to authentic input of the target language has often been called *incidental language learning*. Here it will be referred to as *incidental word learning*, because vocabulary acquisition is the main focus of this study. Incidental word learning refers here to the process of picking up the meaning of words while engaged in communicative activities where vocabulary gain is not the main focus. This usually happens through a focus on the message of communication, rather than the form (de Wilde, Brysbaert, Eyckans, 2019).

A number of studies have focused on incidental word learning and the number of times one needs to be exposed to words in order to learn them. There does not seem to be a definitive answer as to exactly how many exposures are necessary in order to learn a new word. Rott (1999) found that six exposures lead to significantly higher vocabulary gain than two or four exposures, meaning that more exposure to an unfamiliar word increases the likelihood of learning the word. Pigada and Schmitt (2006) found that there were no definite frequency-point where acquisition of the unfamiliar word was assured. However, they did determine that after 10+ exposures the likelihood of acquisition increased significantly. Likewise, Webb (2007) found that 10 or more encounters led to substantial learning gain. The vocabulary gain in reference to incidental word learning is likely also dependent on what is meant by “learning a word”. For example, Waring and Takaki (2003) found that after at least eight repetitions the participants recognized the meaning of 42% of the target words in the immediate multiple-choice test, but were only able to translate 18% of the target words. After three months, the participants were able to recognize the meaning of 24%, but were only able to translate 4% of the target words. Overall, the research seems to suggest that exposure to a new word between 8-10 times provides a reasonable chance for acquisition (Schmitt, 2008).

Research also suggest that incidental word learning is influenced by prior vocabulary knowledge. In their study on incidental word learning in children from watching TV, Neuman and Koskinen (1992) found that prior vocabulary had a positive effect on incidental word learning from watching TV. More recently, both Peters and Webb (2018) and Feng and Webb (2019) found prior vocabulary knowledge to have a positive effect on vocabulary gain when

watching TV or videos. Feng and Webb (2019) also found prior vocabulary knowledge to significantly impact incidental word learning through two additional modes of input; listening and reading. Furthermore, Webb and Chang (2015) studied the impact of prior vocabulary knowledge on incidental word learning in a longitudinal study involving extended reading. Their results showed that higher-level participants learnt significantly more words than participants of lower level. Overall, the research indicates that prior vocabulary knowledge does impact incidental word learning and that picking up words become easier the more words one already knows.

2.7 Types of exposure

2.7.1 reading

For decades the assumption in educational research was that children acquire vocabulary incidentally while reading. However, this claim was unsubstantiated until Nagy, Herman and Anderson (1985) published their study on incidental language learning in children (Swaborn & Glopper, 1999). Since then many studies have been published on the potential for incidental word learning when reading. In fact, most studies on incidental language learning has focused on exposure to written input (Peters & Webb, 2018).

In Nagy, Herman and Anderson's (1985) study, they tested 57 average or above-average eight-grade students' ability to pick up specific target words from relatively short texts. The participants were tested for their vocabulary knowledge before reading and after the reading test and the participants were interviewed and questioned about the target words to test if they had learnt them. The results of the study demonstrated that incidental word learning happens while reading and that learning from context happens when children read natural texts.

As mentioned above, there are numerous studies showing the positive effects of reading in vocabulary acquisition and research show that reading does lead to incidental word learning. Studies have shown that incidental word learning takes place when reading a short text (Webb 2007; Chen & Truscott, 2010; Pellicer-Sánchez, 2016; Zaher, Cobb & Spada, 2001), when reading a single novel (Pellicer-Sánchez, Schmitt, 2010) and through extensive reading (Al-Homoud & Schmitt, 2009; Horst, 2005). For a more comprehensive review on the literature of reading and incidental word learning see Ford-Connors and Paratore (2015).

2.7.2 watching TV and films

Although the majority of research on incidental word learning has focused on written input of authentic English, there has been some research done on the effect of audiovisual input on language proficiency, in the form of watching audiovisual media content such as TV, videos or films in English. As mentioned in 2.5, one of the biggest challenges facing L2 learners is the acquisition of a sufficient vocabulary size to use the language and formal education must be supplemented with large amounts of input to acquire a vocabulary of sufficient size. Webb (2015) argues that watching audiovisual media in English serves as an excellent opportunity for exposure to large amounts of authentic English, leading to development in vocabulary size and listening comprehension, as well as other areas of L2 learning. After all, watching TV, films and videos is an integral part of daily life for most people. In Norway, 16-24 year-olds reported spending on average almost 2 hours every day watching audiovisual media (Statistics Norway, 2019). Considering the availability of English or American produced tv-shows and films, it should be safe to assume that a large part of the content consumed is in English. This provides Norwegian teenagers and young adults ample opportunity for exposure to large amounts of authentic English. Furthermore, watching audiovisual media has been found to be especially beneficial in that one is more often, in comparison to reading, repeatedly exposed to low-frequency words in a relatively short time frame (Cobb, 2007; Webb & Rodgers, 2009a; Rodgers & Webb, 2011).

There have been some studies showing the potential of incidental word learning while watching TV. One of the first studies testing incidental language learning from watching TV was done by Neuman and Koskinen (1992), where 129 bilingual children were tested on their ability to pick up vocabulary from watching segments of a science show aimed at children. The children were divided into 4 groups. One group watched the segment with subtitles, one without, one group read along and listened, and the last group used a textbook only and served as a control group. Overall, the study found substantial vocabulary gain in all audiovisual groups compared to the control group. Furthermore, the most vocabulary gain was found in the group that watched TV with subtitles.

Koolstra and Beentjes (1999) also studied the effect of subtitled TV on vocabulary acquisition. They conducted their study in the Netherlands on 252 Dutch speaking L2 learners of English. The study tested children's ability to acquire language from short clips in English either with or without subtitles. Overall, the study found that the children did pick up language

from both watching with subtitles and watching without subtitles. However, the children who watched the clips with subtitles performed better on the language tests than the children who watched without subtitles. In other words, the language gain was highest for the group watching the clips with subtitles.

More recently, Rodgers (2013) conducted a study measuring the opportunity for language acquisition when watching TV. In contrast to the studies mentioned above Rodgers' study focused on adult Japanese L2 learners of English watching 10 full length episodes of the TV-show *Chuck*. The results of the study showed that the participants did acquire vocabulary by watching the 10 episodes. Overall, the participants learnt an average of 6 of the target words from the 10 episodes and they performed significantly better on the language tests than the control group.

Peters and Webb (2018) did a study on 63 Flemish EFL business students where they tested the participants' ability to acquire vocabulary during a full-length one-hour BBC documentary without subtitles. The participants were tested both in a pre-test and delayed post-test to measure their meaning recognition and form recognition of the target words from the TV-show. The results of the study showed that watching a full-length TV-show can result in substantial learning gains and the participants of the study learnt approximately four words after watching thus indicating that incidental vocabulary acquisition does occur through watching TV.

Finally, Feng and Webb (2019) did a study on Chinese adult L2 learners of English on how they pick up vocabulary in three different modes of exposure. The exposure types were reading, listening and viewing. The participants were divided into three groups and subjected to a pre-test, a post-test and a delayed post-test to measure their knowledge of the target words. The study showed that the participants experienced substantial vocabulary gain in all three exposure modes. Furthermore, the results showed that there was no significant difference in vocabulary gain between the three modes, meaning that reading, listening and viewing are equally beneficial for vocabulary acquisition.

2.7.3 playing video games

Compared to reading and watching TV, videos and films, playing videogames has not received the same amount of attention in regard to incidental language learning. Having said that, there are still some studies on the benefits of playing videogames on language acquisition. Ryu

(2013) researched how players of the game *Civilization* could potentially learn language through playing and through engagement with the gaming-community. Their findings revealed that the participants learnt game-specific vocabulary through gameplay. Furthermore, the participants were also able to practice their language use through communication and discourse with native speakers or players more proficient in English than them. In this way, the study found that playing videogames was beneficial for L2 learners because it facilitated language learning through practice and collaborative interaction.

Dehaan, Reed and Kuwanda (2010) studied the effect of how second language input in the form of playing affected learning, compared to just watching. In other words, they studied how interactivity in the gameplay would affect language learning. The study was executed with paired subjects, where one played an English-language music game and one watched. The participants were then tested in a vocabulary recall test in an immediate and a delayed post-test. The results showed that both the player and the watcher were able to recall vocabulary, however the player recalled significantly more, indicating that the interactivity is more beneficial in terms of language gain.

Brevik (2016) researched what she calls the “gaming outliers”. These outliers were upper secondary school pupils who belonged to the unusual group of pupils who are better readers in English than Norwegian (their native language). Brevik’s research showed that these outliers spent a lot of their free time gaming. In a follow-up study, Brevik (2019) outlined three outlier profiles called *the gamer* who spends up to 8 hours a day on gaming, the *surfer* who spends hours surfing the internet and engaging in language situation commonly involving English and *the social media user* who spends hours consuming and producing content in English on social media. All three outlier profiles revealed a high degree of interest in extramural English and through their extramural activities both read and used English extensively. This interest, according to Brevik seems to be relevant to their unusual L2 reading abilities. Although these studies do not conclusively determine that gaming leads to better language proficiency, they are nonetheless interesting and should merit further research on extramural gaming and its effect on L2 learning.

Sunqvist and Wikström (2015) conducted a study on how extramural gaming affects vocabulary size in 80 Swedish teenagers. The participants were separated into three Digital Game Groups (DGGs) based on gaming frequency, where the first DGG were non-gamers, the second DGG were moderate gamers (<5 h/week) and the third DGG were frequent gamers (>5 h/week). The participants were examined with vocabulary tests, assessed essays, and grades. The results of the study showed that the frequent gamers performed best on all tests. They had

the highest grades and used the most advanced vocabulary in the graded essay, followed by the non-gamers and lastly the moderate gamers. For the vocabulary test, the frequent gamers scored highest, followed by the moderate gamers and lastly the non-gamers. In other words, the frequent gamers out-performed the other groups in all testing areas. Although this study only measured correlation between gaming and language performance and one should therefore be careful to declare causation, the results still indicate a relationship between gaming and language proficiency.

Following this, Sunqvist (2019) conducted a study on 1069 Swedish teenagers on how extramural gaming influenced vocabulary proficiency. In this study, the participants were divided into 4 groups, the non-gamers, the low-frequent gamers (< 3 h/week), the moderate gamers (3-9 h/week) and the frequent gamers (>9 h/week). The participants were tested in two vocabulary tests, the Productive Levels Test (Laufer & Nation, 1999; Nation, 2001) and the Vocabulary Levels Test (Nation, 2001). In both vocabulary tests, the frequent gamers scored the highest, followed by the moderate gamers, the non-gamers and the low frequent gamers respectively. Again, the results of the study do not conclusive determine causality, however it does confirm the same pattern from earlier studies where frequent gamers possess a higher vocabulary than non-gamers.

Although the research on gaming and learning has mostly focused on gaming in an instruction setting, some research, like those presented above, indicates that extramural gaming may have a positive effect on language acquisition. Overall, there is a need for more research on the causality between extramural gaming and language acquisition. However, for now, all that can be said is that it is likely that extramural gaming has a positive effect on learning.

2.8 Comparing different types of extramural input

Several studies have researched the effect of extramural activities that involves exposure to English on L2 learners' language proficiency.

Kuppens (2010) conducted a study focusing on the English proficiency of 374 pupils without any prior English instruction and how extramural exposure to English might have impacted their English proficiency. The participants were tested on vocabulary knowledge, translation from Dutch-English, translation from English-Dutch and grammar. The results from the study showed that watching TV with subtitles significantly and positively affected test

scores on both translation test. Playing English videogames also positively influenced language scores, although this effect was rather limited.

Lindgren and Muñoz (2013) conducted a study on 865 children in seven countries. Their study aimed at uncovering how exposure, parents' educational level and use of English, and linguistic distance influence comprehension. Although the study did not focus specifically on vocabulary knowledge, the results from Lindgren and Muñoz's study is relevant for the current study. The study found that cognate linguistic distance and exposure were the strongest predictors of both listening and reading scores in the language tests. Among the tested exposure types, the best predictor of language proficiency was watching movies and TV in the foreign language. Listening to music in the foreign language and playing videogames were far behind in terms of predicting language proficiency.

Peters (2018) did a study on Belgian L2 learners of English and the effect of extramural exposure on their vocabulary knowledge. The study also tested for length of instruction and the study involved participants from two different age groups; fourth year secondary students and first year university students (mean age 19). Overall, the study found that exposure and length of instruction both influenced vocabulary knowledge positively, but the effects of extramural exposure were larger than length of instruction. In regard to extramural exposure, the study found that using the internet had the largest effect on vocabulary size, followed by watching non-subtitled TV and films and reading books respectively. The study reported no correlation between watching TV with subtitles and vocabulary size and between playing videogames and vocabulary size.

In a similar study Peters, Noreillie, Heylen, Bulté and Desmet (2019) also researched how extramural exposure and length of instruction affect L2 learners. This study, however, was conducted in the Flemish speaking region of Belgium and compared acquisition of English and French. Both languages were foreign languages to the participants and both languages are compulsory subjects in school. The study involved three age groups of participants. These age groups were 2nd year secondary students, 4th year secondary students and 1st year university students. All three age groups had in common that they had received hundreds of hours more French instruction than English instruction during their formal education. The study results revealed that the participants were more exposed to English than French and the most common sources of English exposure was listening to songs, watching TV and movies, playing videogames and visiting websites. The study also revealed that the participants consistently across all three age groups performed better on the vocabulary test in English than French, despite receiving more years of French instruction. However, it should be noted that length of

instruction correlated positively with vocabulary size in both languages. Regarding exposure's effect on vocabulary size, the study revealed that only visiting English websites and playing videogames and using English while playing influenced vocabulary gain, while the other activities measured, like watching TV and reading, did not reveal any significant correlation. It was noted, however, that the lack of impact reported by other variables could be explained by the large amount of extramural exposure reported and a ceiling effect for a number of the questionnaire items.

In Norway, the topic of how extramural exposure to English influence language proficiency has not been widely studied except for some published studies. Busby (2021) studied vocabulary size in Norwegian university students in relation to their field of study and exposure to English. Busby found extramural exposure to English to be a stronger predictor of higher vocabulary size than formal English education. Additionally, Brevik (2016,2019), presented in 2.7.3, has studied the effect of extramural exposure through playing videogames and found that playing videogames might be the reason why some poor L1 readers are strong L2 readers. Lastly, a few master's theses (York, 2016; Eye, 2016; Busby, 2015) have studied the influence of extramural exposure to authentic English on English proficiency. These studies have all been done on Norwegian L2 learners attending either upper secondary school or university. Therefore, there is a need for further research on how extramural exposure to authentic English affects younger students' English proficiency. More knowledge on this topic can, potentially, have far reaching consequences for how foreign language teachers across the country structure their foreign language instruction.

3.0 Method

3.1 The current study

The goal of this study was to explore the English proficiency of Norwegian grade 10 students and how extramural exposure to authentic English contributes to their English proficiency. The study focuses on extramural activities such as watching English movies and tv-shows, reading in English and playing videogames and how much time the students spend engaged in these activities. The goal was to determine how much time the students spend engaged with these activities and how activities like these affect the students' English proficiency. Furthermore, the aim was to discover if some extramural activities are more linguistically rewarding than others. More specifically, the study addresses these three research questions:

1. To what extent are Norwegian sixteen-year-olds engaged in extramural activity that exposes them to authentic English and is there some activity that is especially common?
2. Can time spent on activities that expose the participants to authentic English predict language proficiency and if so, to what extent?
3. Are there any differences between the various activities in how they affect the students' English proficiency?

3.2 Participants

The participants were chosen by a convenience sampling. Three English teachers for the year ten classes of a local school were approached with an inquiry for their classes to participate in the research. From these three classes a total of 130 15-year-olds completed the vocabulary test and filled out the questionnaire. Of these 130 students, a total of 27 students were excluded from the final analysis. These students were excluded for various reasons that could affect either their English proficiency or the reliability of the study and were thus removed to strengthen the validity of the research. Firstly, eleven students were removed because they reported having English as a mother tongue or because they reported having native English-speaking parents. These were removed because they would likely have a higher exposure to English from an earlier age than the regular Norwegian teenager. Secondly, eight students were removed because they were not born in Norway and were more than six years of age when they arrived in the country. In other words, they would have had a different educational background than the rest of the sample and were therefore removed to ensure that all participants had as close to an identical educational background as possible. Thirdly, four participants were excluded because they did not answer the questions about language background. In other words, there would be no way to tell if these participants have English as a first language or not. Fourthly, 3 students were removed because they wrote jokingly on the open question about gender, rather than report their gender. This indicated that they would not take the testing seriously, and they were therefore removed to ensure the reliability of the study. Lastly, one participant was excluded because they only answered 40% of the vocabulary test. After removing the 27 participants that did not fit with the sample, we were left with 103 participants, 51 of them being female and 52 males.

3.3 Materials and procedure

The study was conducted as a quasi-experiment where the experiments were carried out with three separate groups on three occasions, where the students, using their computers, filled out a form at school during their English lesson. This was done using www.nettskjema.no, a survey software developed by the University of Oslo. The form consisted of the vocabulary test to determine their English proficiency and a questionnaire. The vocabulary test used was the Vocabulary Size Test (Nation & Beglar, 2007). The questionnaire was designed by me in cooperation with my thesis advisor. To ensure that the testing went as smoothly as possible, the survey was pilot-tested on a different class of year ten students. Unfortunately, because of the current Covid19 pandemic and a local outbreak, the attendance in the pilot test class was quite low. Nevertheless, a total of six students were able to pilot-test the survey and give their feedback. The students who participated in the pilot-test were not a part of the final sample.

3.4 Testing proficiency – the vocabulary test

Due to the somewhat limiting nature of this study, receptive vocabulary size was chosen as this study's proxy for language proficiency. Vocabulary was chosen because it is a good indication for language competence and is one of the most important as well as perhaps the most challenging aspect of learning a second language (Schmitt, 2008). That is not to say that other parts of language competence, like grammar knowledge, reading, writing etc. are not important. However, as the British linguist David Wilkins stated: "Without grammar very little can be conveyed, without vocabulary nothing can be conveyed." (Wilkins, 1972, p. 111).

The vocabulary test used in this study was a slightly modified version of the Vocabulary Size test (VST) designed by Paul Nation and David Beglar (2007). The VST was designed to measure learners' receptive vocabulary size of the 1st thousand word-families to the 14th thousand word-families in English. The test presents the participants with a sample of ten words from each of the 14 levels. The first level is the first thousand most used word families, the second level is the second thousand most common word families and so on. All the words presented to the participants were accompanied by a sentence using the target word and four alternatives, where one alternative matched the word and how it was used in the example sentence, as seen in (1).

(1) SAW – they SAW it

- a. cut
- b. waited for
- c. looked at
- d. started

The participants were asked to read the sample words and how they are used in the example sentence and study the alternatives and pick the alternative they believed to be correct. There was no “I don’t know” option in the test and the students were also asked to answer every question, regardless of whether they knew the answer or not. This was done to encourage the students to use partial knowledge and context to complete the test. When the students finished the test, their answers were analyzed, and each correct answer was counted. This would give every participant a number of correct answers between 1 and 100 (not 140 as in the original version of the test, see below for explanation on the modification of the VST done in this study). Because the test only uses 10 sample words from each level, the number of correct answers must be multiplied with 100 to find the participants estimated vocabulary size. For example, if a participant had 52 correct answers they would have an estimated receptive vocabulary size of the 5200 most common word-families.

Some steps were taken to ensure that the test was manageable for the students. Firstly, the order of presentation of the words were mixed up. Instead of presenting all ten words from level one, followed by all ten from level two, the students were presented with the first word from level one, followed by the first word from level two and so on. This was done to encourage the students to keep going by mixing the higher level, and thus more difficult, words in between the lower level words. Furthermore, the test was also slightly modified to minimize fatigue and to ensure that all students would be able to finish the test in the time allotted (55 minutes) during their class. For this reason, the test, which originally contained 140 words and measured vocabulary size up to the 14th most common word families, was cut down to 100 words. This means that the test would only measure up the 10 thousand most common word families. Although this change might have caused a slightly lower estimated vocabulary size on average within the sample, this change was deemed acceptable because the vocabulary test was only intended to be used in measuring the participants estimated vocabulary within the group and in comparison to each other. This change might have carried the risk of a ceiling effect, where there would be no way of differentiating between participants with a higher than 10-thousand-word vocabulary. However, considering the participants’ age and expected proficiency level,

the risk of any of the participants having a larger vocabulary than 10 thousand words was quite low. Ultimately, this proved to be a necessary step, as there were several participants who just barely managed to finish the test and fill out the questionnaire in the time allotted.

Finally, one error in the VST that was presented to the participants must be commented on. Unfortunately, there was a typographical error in the example sentence of the word *VEER* on the 6th thousand level. The example sentence in the VST says “the car VEERED”, with the correct answer alternative being “went suddenly in another direction”. Due to a human error, the example sentence presented to the participants was “the cat VEERED”. This may have impacted the results slightly. When looking at the answers for the word VEER, a large portion of the participants incorrectly answered: “made a very loud noise”. Seeing as cats habitually make loud noises, it is imaginable that many chose this option because of the inclusion of the word *cat* in the example sentence. Having said that, the word VEER does not mean “to make a loud noise” and any participants conscious of that fact would not choose that option. For this reason, no steps have been taken to remedy this error in the test.

3.5 Questionnaire

After completing the vocabulary test, the students were asked to fill out a questionnaire (presented in appendix 1) about their daily habits that involve exposure to the English language, such as watching audiovisual media, playing videogames and reading. These were the primary independent variables for this study.

The questions about their habits were mostly asked in the form of closed ended questions with multiple scaled options. The questionnaire was carefully designed to make the questions and their corresponding answer options in a way that would be straightforward and easy to both understand and answer for a 16-year-old. Therefore, the questions were designed to be understandable and unambiguous, written in a simple language that would still yield accurate results. Similarly, the answer options would also have to be complex enough to yield responses that would be an accurate representation of the participants’ lives, while also not being so complex that they might lead to confusion or guessing.

The questions about the participants’ daily habits provided a challenge in finding this balance between complex enough, but not confusing and difficult to answer. Ideally these questions would yield answers that would be easily quantifiable, such as hours spent, on average, watching TV per week or day. However, framing the questions like this could arguably

lead to some problems. For one, there is no certainty that a 16-year-old has an active knowledge of how much time they spend each week engaged in these activities. Therefore, a question about number of hours spent each week might be picked rather arbitrarily. Similarly, a question about number of hours per day, might lead to some confusion for participants who spend a lot of time watching TV, for example, on some days, but not every day. Because of these considerations, the decision was made to include two questions for each of the independent variables; “watching TV, movies or videos with Norwegian subtitles”, “watching TV, movies or videos with English subtitles or no subtitles”, “playing singleplayer videogames”, “playing multiplayer videogames” and “extended extramural reading”. These questions were structured as shown in (2), translated into English for the reader’s convenience.

- (2) Q: Approximately how often do you watch TV, movies or videos on the internet in English with Norwegian subtitles?
- a. Never
 - b. Once in a while, but not every week
 - c. At least once every week
 - d. Multiple times per week
 - e. Almost every day
 - f. Every day

If the participants picked the options “almost every day” or “every day”, they would trigger another question in the format of (3).

- (3) Q: During an average day, approximately how much do you watch TV, movies or videos on the internet in English with Norwegian subtitles?
- a. Less than 1 hour
 - b. 1 to 2 hours
 - c. 3 to 4 hours
 - d. 4 to 5 hours
 - e. More than 5 hours

Framing the questions on the independent variables in this manner meant that converting the results into measurable data was more challenging. However, this solution was deemed appropriate since the resulting data would be more reliable.

In addition to the questions about the primary independent variables, the questionnaire also contained questions on other daily habits such as their social media use, how often they talk and write outside of school and their motivation for learning English. These questions were asked to gather data in order to control for other variables that might have impacted their results on the vocabulary test. Lastly the students were asked questions about their language background in order to detect any participants who were not eligible to partake in the study.

3.6 Ethical considerations

The ethical considerations for this study were of course taken very seriously. Firstly, the study was submitted to and cleared by NSD – Norwegian center for research data. Secondly, all participants were informed both orally and in writing about their rights as participants in the study, such as their right to give informed consent and their rights to confidentiality. The students were told about the study, what it was about and how they would contribute to the study. Furthermore, they were also informed that all data from the study would be handled confidentially and that there would be no way to identify any individuals in the final thesis. Thirdly, Special care was taken to ensure that the students were made aware that participation was voluntary, even though it was done in class, and that their teachers had prepared optional work for them to do during the class should they choose not to participate. Lastly, the participants gave their consent by reading the statement of consent (presented appendix 2) which stated that if they carried out the vocabulary test and answered the questionnaire, they gave their consent for their data to be used in the study.

4.0 Results

4.1 Descriptive statistics

Table 1 presents the data from the dependent variable “vocabulary size” in addition to the independent variables “watching TV with Norwegian subtitles”, “watching TV with English or no subtitles”, “reading in English”, “playing singleplayer videogames” and playing multiplayer videogames”. Additionally, the control variables “speaking English” and “writing English” is shown.

Table 1.0 *Descriptive statistics - total*

| Variables - total | Obs. | Mean | Std. dev | Min | Max |
|--------------------------|-------------|-------------|-----------------|------------|------------|
| Vocabulary size | 103 | 63.039 | 12.739 | 26 | 85 |
| TV w/ NOR sub | 103 | 3.913 | 2.860 | 0 | 10 |
| TV w/ ENG sub | 102 | 5.176 | 2.788 | 0 | 10 |
| Reading | 103 | 2.155 | 1.786 | 0 | 7 |
| Singleplayer videogames | 103 | 1.796 | 2.171 | 0 | 9 |
| Multiplayer videogames | 103 | 3.136 | 3.199 | 0 | 10 |
| Talking | 103 | 2.379 | 1.476 | 0 | 5 |
| writing | 103 | 2.379 | 1.515 | 0 | 5 |

The results from the vocabulary size test show that the participants (n=103) had a mean score of 63, meaning that the participants had an average written receptive vocabulary knowledge of the 6300 most common word-families in English.

As presented in 3.5, the questions about the participants daily habits were broken into two parts. One question for how often they engage in the activity and one question about the number of hours they are engaged in the activity during a day, triggered if they first answered that they were engaged in this activity each day or nearly every day. The data from these questions were combined and converted into what is here called *exposure score*, a continuous variable between 0-10 (for a full description on exposure score see appendix 3). The most common daily activity for the participants was watching audiovisual media with English subtitles or no subtitles with mean exposure score 5.2. Following that, audiovisual media with Norwegian subtitles and playing multiplayer videogames were the second and third most common with mean exposure score 3.9 and 3.1 respectively. The fourth most popular activity was reading in English outside of school work with mean exposure score of 2.2. Finally, the

least popular extramural activity in this study was playing singleplayer videogames with a mean exposure score of 1.8. The two variables measuring language use, talking and writing, reported exactly the same score with a mean exposure score of 2.4.

In addition to the total scores for the dependent and independent variables, it is interesting to view the differences between the genders and how they scored on the different variables. The descriptive statistics divided by gender is presented in table 1.1 and 1.2.

Table 1.1 *Descriptive statistics - boys*

| Variable - boys | Obs. | Mean | Std. dev | Min | Max |
|-------------------------|-------------|-------------|-----------------|------------|------------|
| Vocabulary size | 52 | 64.115 | 12.734 | 27 | 84 |
| TV w/NOR sub | 52 | 3.635 | 2.787 | 0 | 10 |
| TV w/ENG sub | 52 | 6.288 | 2.539 | 1 | 10 |
| Reading | 52 | 2.25 | 1.736 | 0 | 7 |
| Singleplayer videogames | 52 | 2.654 | 2.3 | 0 | 9 |
| Multiplayer videogames | 52 | 5.519 | 2.762 | 0 | 10 |
| Talking | 52 | 2.904 | 1.418 | 0 | 5 |
| Writing | 52 | 2.981 | 1.421 | 0 | 5 |

Table 1.2 *Descriptive statistics - girls*

| Variable - girls | Obs. | Mean | Std. dev | Min | Max |
|-------------------------|-------------|-------------|-----------------|------------|------------|
| Vocabulary size | 51 | 61.941 | 12.777 | 26 | 85 |
| TV w/NOR sub | 51 | 4.196 | 2.933 | 0 | 10 |
| TV w/ENG sub | 50 | 4.02 | 2.575 | 0 | 10 |
| Reading | 51 | 2.059 | 1.848 | 0 | 7 |
| Singleplayer videogames | 51 | 0.922 | 1.635 | 0 | 9 |
| Multiplayer videogames | 51 | 0.706 | 1.082 | 0 | 10 |
| Talking | 51 | 1.843 | 1.347 | 0 | 5 |
| Writing | 51 | 1.765 | 1.365 | 0 | 5 |

Some noteworthy results are revealed when dividing the data by gender. Firstly, and somewhat surprisingly, the boys scored on average higher on the vocabulary test than the girls, with a mean score of 64.1 for the boys and mean 61.9 for the girls. In other words, the male part of the sample had on average a receptive vocabulary size of around 200 more words than the female

part. Secondly, a notable difference between the genders is seen in both gaming variables, where the boys scored significantly higher than the girls. In fact, the boys scored significantly higher on all exposure scores except for the variable for watching audiovisual media with Norwegian subtitles. In other words, the results from the survey suggest that boys are generally more engaged in extramural activities that exposes them to authentic English than the girls.

4.1.1 Social media use and motivation

Social media use and motivation were initially included in the questionnaire as control variable, indented to pick up other influences on vocabulary size outside of the primary independent variables. However, for various reasons detailed below, the social media and the four motivation variables were excluded from the final analysis. The descriptive statistics for social media use and motivation is presented in table 2.

Table 2. *summaries of the discarded variables*

| Variables | Obs. | Mean | Std. dev | Min | Max |
|----------------------------|-------------|-------------|-----------------|------------|------------|
| Social media use | 103 | 4.650 | .977 | 1 | 5 |
| General motivation | 103 | 3.699 | .979 | 1 | 5 |
| Motivation – better grades | 101 | 4.010 | .889 | 1 | 5 |
| Motivation – free time | 103 | 3.874 | .848 | 1 | 5 |
| Motivation - career | 103 | 4.010 | .846 | 1 | 5 |

As seen by table 2, the use of social media was very widespread, as the participants had a mean exposure score for social media use of 4.650/5, with a standard deviation of 0.98. This means that nearly all of the participants, except for a few outliers, reported that they used social media every day. Because the use of social media proved to be so common among the participants, the decision was made to exclude social media use from the final analysis, because the variance in the sample would be too little to pick up any significant impact of social media use on the dependent variable

The questions concerning the participants' motivation for learning English were broken into four parts. One question for overall motivation, one question for motivation to learn English to get better grades in school, one question for motivation to learn English to use it during their free time and one for motivation for learning English to further a future career. As seen in table 2, the participants generally reported to be motivated to learn English in all four areas. Where 1 was “very unmotivated” and 5 was very motivated, the participants reported a

mean 3,699 (SD=0,979) for general motivation, 4,010 (SD=0,889) for motivation to get better grades, 3,874 (SD=0,848) for motivation in order to use English during their free time and 4,010 (SD=0,846) for motivation to learn English to further their future career.

After a review of the results, the decision was made to exclude the four variables for motivation from the regression analysis. The variables for motivation were excluded for a few different reasons. Firstly, there was some doubt concerning the reliability of these self-report questions in the questionnaire. It was decided that we could not rely on 15-year-olds to interpret and answer questions about their motivation for learning English in way that would yield reliable and valid data. Furthermore, as seen in table 2, there was very little variance in the data between the four motivation variables and the standard deviation was quite small compared to the other independent variables. This was also a contributing factor to why these variables were excluded from the analysis.

4.2 Linear regression model – base model

The variables presented above were analyzed using a multiple linear regression model shown in table 3. Table 3 reports the base model with only the dependent and independent variables included, with no improvements or changes made. The model shows the effects of the independent variables on the dependent variable in a multi variate analysis. The linear regression equation is presented below.

$$Vocabulary\ size_i = \alpha_0 + b_1 \times \beta_{1i} \text{ TV with NOR sub} + b_{2i} \times \beta_{2i} \text{ TV with ENG sub} + b_{3i} \times \beta_{3i} \text{ reading} + b_{4i} \times \beta_{4i} \text{ singleplayer} + b_{5i} \times \beta_{5i} \text{ multiplayer} + b_{6i} \times \beta_{6i} \text{ talking} + b_{7i} \times \beta_{7i} \text{ writing} + \mu$$

Here *vocabulary size* refers to the dependent variable measuring the participants vocabulary size and *i* represents the participants. b_{1i} is an expression of the regression coefficient of the independent variable $\beta_{1i} \text{ watching TV with NOR subtitles}$. Similarly, b_{2i} is the expression for the independent variable *watching TV with ENG subtitles*. This logic follows for the entire equation and μ_i is the residual which detects other factors not controlled for.

Together the independent variables determine the model's explanatory power with the multiple correlation coefficient (R^2) which is a measure of the degree to which changes in the dependent variables can be explained by changes in the independent variables. The base model

in table 3 has an adjusted R² score of 0.1677, meaning that the independent variables are responsible for 16.77% of changes in the dependent variable.

It should also be noted that N shows the number of observations being 102. This is because the results from one participant were not a part of the regression analysis because of a missing value in the *watching TV with English subtitle* variable.

Table 3 *Base model*

| | B | SE | T | Sig.t |
|-------------------------|----------|-----------|----------|--------------|
| Gender | 1.242 | 3.595 | 0.35 | 0.731 |
| (Male = 1, Female = 0) | | | | |
| TV w/NOR sub | -1.002 | 0.423 | -2.37 | 0.020* |
| TV w/ENG sub | 0.908 | 0.497 | 1.83 | 0.071 |
| Reading | 1.727 | 0.711 | 2.43 | 0.017* |
| Singleplayer videogames | 0.830 | 0.609 | 1.36 | 0.176 |
| Multiplayer videogames | -1.066 | 0.627 | -1.70 | 0.092 |
| Talking | 0.298 | 1.104 | 0.27 | 0.788 |
| Writing | 0.615 | 1.138 | 0.54 | 0.590 |
| Constant | 57.908 | 3.300 | 17.55 | <0.001 |
| N | 102 | | | |
| Adjusted R ² | 0.1677 | | | |

** p<0.01, *p<0.05

Table 3 displays how the different independent variables affect the dependent variable *vocabulary size*. As seen in the table, the best indicator of language competence, i.e. higher vocabulary size, is spending time reading books. The B-coefficient tells us that for every 1 point raised in exposure score for reading, the vocabulary size raises by 1.727 and the result is statistically significant (p = .017). Similarly, the B-coefficient for watching audiovisual media with English subtitles or no subtitles is correlated with higher vocabulary size. Although this result is nearly significant (p = 0.071), it still does not reach the threshold for statistical significance (p<0.05). Similarly, playing singleplayer videogames, talking and writing all positively affect vocabulary size, but are not statistically significant. Of all independent variables, only watching audiovisual media with Norwegian subtitles and playing multiplayer videogames have a negative impact on vocabulary size. Of the two, the result for watching audiovisual media with Norwegian subtitles is significant (p = .020). Lastly, the results for the

gender variable tells us that being male raises the predicted vocabulary size by 1.242. However, this result is nowhere near statistically significant ($p=0.731$).

4.3 changes and improvements made to the base model

Some changes and improvements were made to the base model leading up to the final model. Firstly, the negative coefficient for the variable *playing multiplayer videogame* was very surprising as it contradicted previous research on the topic (see section 2.7.3). Based on results from Sundqvist and Wikström (2015) and Sundqvist (2019), the suspicion was that there was some connection here that was not picked up by the base model in table 3. Therefore, it was decided to check for a potential curved linear (polynomial) relationship between playing multiplayer videogames and vocabulary size. The polynomial variable was created by squaring the data in the variable *playing multiplayer videogames*, thus creating the variable *playing multiplayer videogames squared*. The polynomial variable for playing multiplayer videogames was then added to the final analysis seen in table 4.

Furthermore, regarding the variable *playing multiplayer videogames*, from table 1.1 and 1.2, we see that there is a substantial difference between the genders in the mean exposure score for this variable. Therefore, it was decided to test for a potential difference between the genders in how playing multiplayer videogames affects vocabulary size. This was done by creating an interaction term by multiplying the data from the variables *gender* and *playing multiplayer videogames*, creating the *multiplayer videogames*gender* variable. This variable was then added to the final analysis seen in table 4.

After including the polynomial variable and the interaction term, the regression analysis was done running the analysis in STATA, the statistical analysis software, several times, sequentially adding blocks of variables to analyze differences within the model with the inclusion of different independent variables. Doing this allowed us to see what impact the individual variables had on the model. By running this sequential regression analysis, it was discovered that the control variables *talking* and *writing* did not have any impact on the model. None of the variables were significant and both variables lowered the model's correlation coefficient (R^2), meaning that the model explained less of the variance in the dependent variable *vocabulary size* with the inclusion of these variables. Since the aim of the regression analysis is to explain the variance in vocabulary size, the variables *talking* and *writing* were discarded

from the final model. (see appendix 4 for the sequential regression models including *talking* and *writing*)

4.4 final model

The final model after improvements and changes is presented in table 4. In reality the only changes done were the inclusion of the polynomial variable for *playing multiplayer videogames*, the inclusion the interaction term *playing multiplayer videogames*gender* and the exclusion of the *talking* and *writing* variables. One notable difference in the final model is the increase in the adjusted R² which went from 0.1677 to 0.2618, meaning that the inclusion of the polynomial variable and the interaction term and the exclusion of the *talking* and *writing* variables caused a substantial increase in explanatory power. The final model now explains 26.18% of the variance in the dependent variable as opposed to 16.77% in the base model.

Table 4 *Final model*

| | B | SE | T | Sig.t |
|---------------------------|----------|-----------|----------|--------------|
| Gender | -12.340 | 5.174 | -2.39 | 0.019* |
| (Male = 1, female = 0) | | | | |
| TV w/NOR sub | -1.048 | 0.395 | -2.65 | 0.009** |
| TV w/ENG sub | 1.190 | 0.441 | 2.69 | 0.008** |
| Reading | 1.569 | 0.680 | 2.31 | 0.023* |
| Singleplayer videogames | 0.675 | 0.565 | 1.20 | 0.235 |
| Multiplayer videogames | 0.811 | 1.708 | 0.48 | 0.636 |
| Polynomial variable | -0.660 | 0.190 | -3.47 | 0.001** |
| (multiplayer*multiplayer) | | | | |
| Interaction term | 5.296 | 2.034 | 2.60 | 0.011* |
| (multiplayer*gender) | | | | |
| Constant | 58.798 | 2.994 | 19.64 | <0.001 |
| N | 102 | | | |
| Adjusted R ² | 0.2618 | | | |

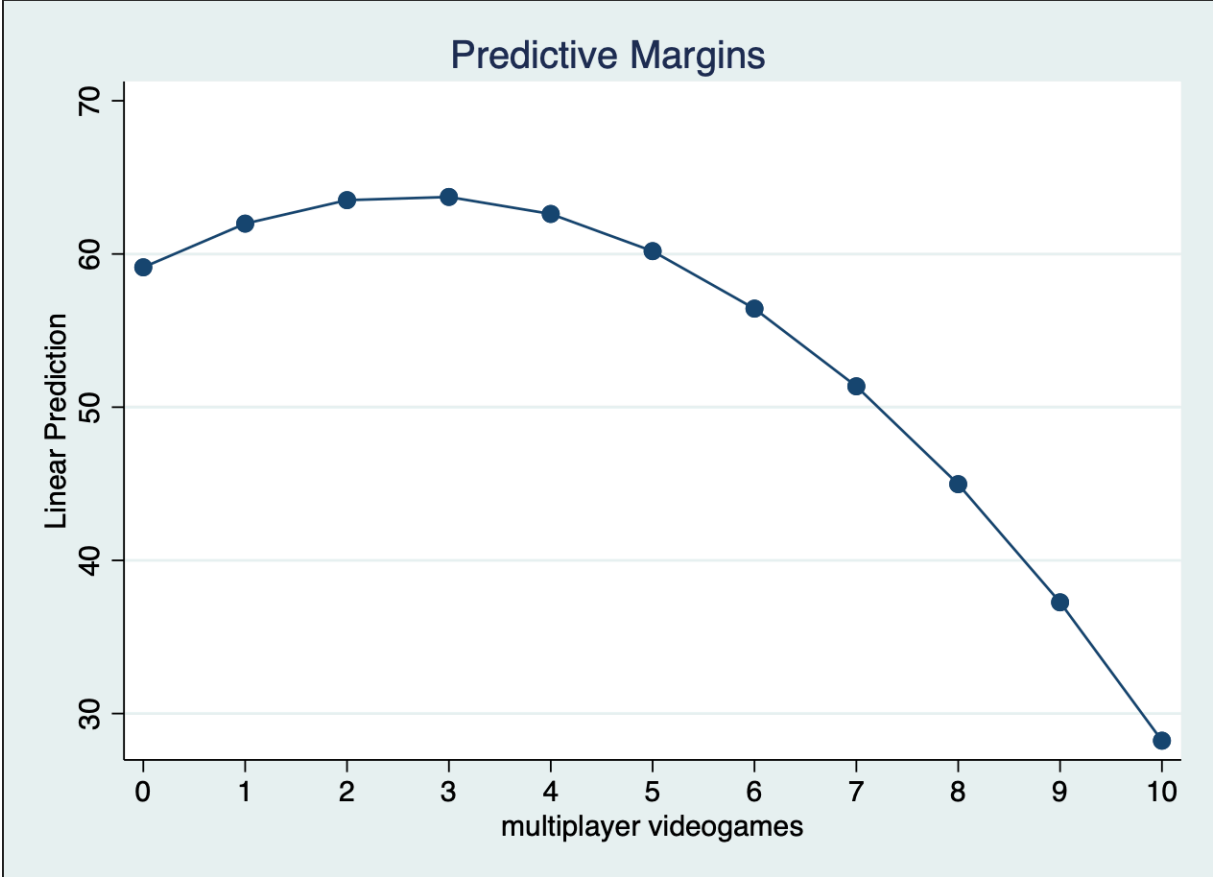
** p<0.01, *p<0.05

Similar to the base model, spending time reading is a good indicator of language competence, i.e. higher vocabulary size, with a significant (p = 0.023) B-coefficient of 1.569. Watching audiovisual media with English subtitles or no subtitles is also a good indicator of language proficiency with a B-coefficient of 1.147 and this result is statistically significant (p = .008) in

the final model in opposition to the base model in table 3. Playing singleplayer videogames still has a positive effect on the independent variable, but is also still not significant ($p = 0.235$). The only variable directly associated with a negative effect on vocabulary size is watching TV with Norwegian subtitles, which is also significant ($p = .009$). With the inclusion the interaction term, the variable *gender* has become significant ($p=0.019$) and indicates that being male is a negative predictor of language proficiency with a B-coefficient of -12.340. However, because the interaction term covers the participants who play multiplayer videogames, the *gender* variable only reveals the comparison between the boys and the girls who do not play multiplayer videogames. In other words, being a non-gaming male is a statistically significant negative indicator of vocabulary size compared to non-gaming females. Regarding the boys who play multiplayer videogames, the interaction term reveals that playing videogames as a male has a large and significant ($p=0.011$) positive effect on vocabulary size.

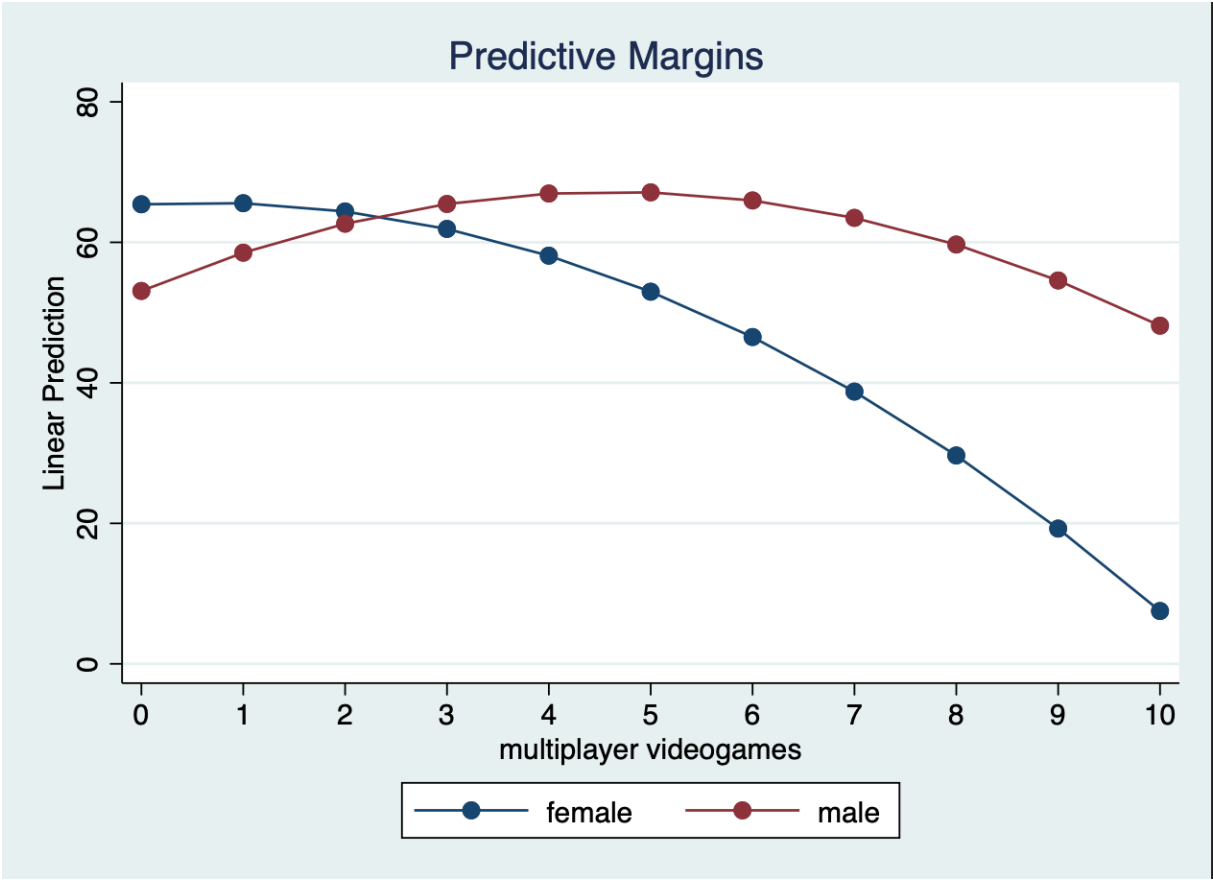
Finally, the results from the *playing multiplayer videogames* and the polynomial variable for *playing multiplayer videogames* tells us that there is indeed a statistically significant ($p=0.001$) curved linear relationship between the dependent variable *vocabulary size* and playing multiplayer videogames. These results are shown in the graph in table 5.0.

Table 5.0 Graph showing the polynomial relationship between playing multiplayer videogames and vocabulary size.



According to these results, the vocabulary size increases for every exposure point until it reaches its zenith at around three exposure points, after which it starts to decline at a rate of -0.660 for every subsequent exposure score. This curved linear relationship was significant for both genders. However, as we know, there was also a significant difference between the genders in how playing multiplayer videogames affects language proficiency. This difference is shown in table 5.1.

Table 5.1 Graph showing the difference between genders in how playing multiplayer videogames affects language proficiency



As seen by table 5.1, the curved linear relationship between vocabulary size and playing multiplayer videogames is present for both genders. However, how gaming affects the two genders is very different. As mentioned, the non-gaming girls have on average a larger vocabulary size than the non-gaming boys. However, the boys’ vocabulary score is affected to a much higher degree than the girls’ vocabulary score with an increase in exposure points for multiplayer gaming. The girls’ average vocabulary size rises until it reaches its zenith on around one exposure score point before it starts to decline. The boys’ average vocabulary score, meanwhile, surpasses the girls around two exposure score points and climbs until it reaches its peak at around five exposure score points, before declining.

5.0 Discussion

5.1 Learners' exposure to English

The first research question of this study concerns the participants' daily habits and to what extent Norwegian 15-year-olds are engaged in activities that expose them to authentic English. Overall, it is safe to say, from the results of this study, that Norwegian 15-year-olds are regularly engaged in extramural activities that expose them to authentic English input. Of all the extramural activities tested for, using social media was the most popular one. Although social media use did not have the highest exposure score, it is important to keep in mind that social media was not a primary variable and was only tested as a control variable. For this reason, the participants only answered one question about social media use in the format of (2) in section 3.5. Therefore, the highest possible exposure score for social media was 5, in contrast to the primary independent variables whose highest possible exposure score was 10. Therefore, despite *watching TV without subtitle or with English subtitle* having a mean exposure score of 5.178/10, social media use can still be regarded as the most popular extramural activity with a mean exposure score of 4.65/5.

Among the primary independent variables, the most popular extramural activity was watching English audiovisual media. The activity watching audiovisual media in English was separated into two variables; one for watching in English without subtitles or with English subtitles and one for watching with Norwegian subtitles. Interestingly, watching English audiovisual media without subtitles or with English subtitles was more common than watching with Norwegian subtitles. This result contradicts Kuppens (2010) who reported that their participants favored English television or movies with subtitles. This can, however, be explained by the fact that Kuppens carried out their research on children without any prior English education, while the current study focused on teenagers after nearly 10 years of obligatory English instruction. Furthermore, it is also likely that Kuppens found subtitled TV to be more popular, because their study took place in 2010 when linear TV, with subtitles, was presumably more popular, as opposed to today, when a lot of media content is consumed through streaming services (Statistics Norway, 2020a) where subtitles are optional. In this sense, the participants in this study resembled the participants in Peters' (2018) study who reported watching more non-subtitled TV than subtitled. Furthermore, looking at the results of the vocabulary test, the participants in this study had an average receptive vocabulary size of 6300 word-families. This would mean that the average participant in this study has a sufficient vocabulary size for 98% comprehension of spoken input for most TV-shows, films or videos in

English (Webb & Rogers, 2009a; Webb & Rogers, 2009b). This coupled with the fact that a lot of audiovisual media today is consumed through the internet on streaming sites and/or video-sharing sites such as Youtube, where subtitles can be either turned off or set to the preferred language (Statistics Norway, 2020a), it is not that surprising that watching without subtitles or with English subtitles is more common.

The second most popular extramural activity was gaming, or to be more precise; playing multiplayer videogames which means playing videogames with others through the internet. Playing singleplayer videogames on the other hand was the least popular extramural activity. The popularity of playing multiplayer videogames was not surprising, given that previous research has found playing videogames to be consistently among the most popular extramural activity for children and teenagers (Kuppens, 2010; Lindgren & Muñoz, 2013; Peters, 2018; Peters et al., 2019). More surprising was the lack of popularity for singleplayer videogames, meaning games where you play by yourself. However, it should be noted that the previous research mentioned above makes no distinction between singleplayer and multiplayer videogames and groups all types of videogames together in one category. It could thus be the case that this difference in popularity between singleplayer and multiplayer is present also in their studies, but was not tested for. Finally, it should be noted that this study also found a substantial disparity between the boys and the girls and the boys spent a lot more time playing videogames than the girls did, mirroring the results from Sundqvist and Wikström (2015), Sundqvist (2019) and Peters et al. (2019) among others.

Concerning reading, the study shows that this is an activity that is not very common among the participants. It is however not as uncommon as one would expect from other studies such as Peters (2018) and Peters et al. (2019). Having said that, Peters (2018) notes that the participants in their study might be engaged in reading activities on the internet which their questionnaire did not pick up. This study, however, did include reading long texts on the internet as part of the question about extramural reading, which might be the reason why reading has a higher exposure score than anticipated.

Finally, this study also included talking and writing as control variables. The results show that the students use English outside of school quite often, which is also what Peters et al. (2019) found.

5.2 The effects of extramural exposure on vocabulary size

The second research question in the current study asks if it is possible to predict language proficiency by how much time is spent engaged in extramural activities that exposes the students to authentic English and to what extent this is possible. The third research question asks if there are any differences between the different activities in how they affect the students' English proficiency. The results from the questionnaire and the vocabulary size test were analyzed using a linear regression model, which allows us to analyze and predict how extramural activities that involve exposure to authentic English input influence language proficiency, here represented by receptive vocabulary size. Looking at the final model in table 4, we see that language proficiency can indeed be predicted by the amount of time the participants spend on extramural activities that expose them to authentic English input. From table 4, it is evident that the largest influences on language proficiency is (1) playing videogames, (2) reading, (3) watching TV without subtitle or with English subtitles and (4) watching TV with Norwegian subtitles (although this is a negative correlation). Playing singleplayer videogames was not significant and therefore cannot be said to be a predictor of language proficiency, at least for the present study. There are several observations that should be noted from these results.

Firstly, the *playing multiplayer videogames* variable produced some very surprising and interesting results. On the one hand, the results show that playing videogames positively influence language proficiency, especially for the boys. The interaction term showed a higher effect on vocabulary size ($B=5.296$) from playing multiplayer videogames for the boys than any other independent variable. Initially, when looking at the differences in vocabulary test-scores in tables 1.1 and 1.2, it was surprising to see that the boys scored higher than the girls. This was surprising because girls generally get better marks in English than boys (Statistics Norway, 2020a). However, the final model showed that the non-multiplayer-gaming girls do indeed have a higher vocabulary compared to the non-gaming boys. This is quite telling for the effect playing multiplayer videogames may have on vocabulary size. Indeed, considering that the non-gaming girls have a higher vocabulary size than the non-gaming boys, while altogether the boys scored higher than the girls on the vocabulary test, the findings suggest that the reason for the boys' higher average vocabulary size is their tendency to be more frequent gamers. This positive relationship between playing videogames and vocabulary size agrees with previous research (Sundqvist & Wikström, 2015; Sundqvist, 2019; Peters et al. 2019; De Wilde) and supports the research done by Ryu (2013) and Dehaan, Reed and Kuwanda (2010) who found that playing videogames is beneficial for language acquisition. On the other hand, the present

study found that, although playing videogames positively impacts vocabulary size, this only holds true up to a certain point, after which the effects stagnates and start to decline. In other words, the findings suggest that playing multiplayer videogames is beneficial when practiced with moderation. This curved linear relationship between playing videogames and language proficiency is in direct opposition to both Sundqvist and Wikström (2015) and Sundqvist (2019) who found that the most frequent gamers consistently scored better on the language and vocabulary tests. The reason behind this peculiar result can only be speculated on for now and does call for more research on the topic. Finally, in regard to gaming, it should be noted that the results of the current study somewhat support Sundqvist (2019) who found that playing multiplayer videogames was more linguistically rewarding than playing singleplayer videogames, as the current study found no significant relationship between singleplayer gaming and language proficiency.

Secondly, the variables for watching audiovisual media are very interesting. Watching audiovisual media with Norwegian subtitles is the only variable with a negative coefficient, which predicts that the more the participants watch audiovisual media with Norwegian subtitles, the lower their receptive vocabulary size will be. This results directly contradict the research done by Neuman and Koskinen (1992) and Koolstra and Beentjes (1999) who found that watching TV with subtitles is more beneficial for language acquisition than watching TV without. This result, however, should be analyzed with caution, as there may be other explanations for the apparent effect of watching audiovisual media with Norwegian subtitles. For one, in a time where a lot of audiovisual media is consumed through the internet where the viewer has the option to turn subtitles off or use subtitles in another language, it may be that the more proficient participants more often watch audiovisual media with subtitles in English or without subtitles. Thus, the ones who use Norwegian subtitles may be the participants who already have a lower vocabulary size. As seen in section 2.5, Webb and Rogers (2009a) and Webb and Rogers (2009b) found that a vocabulary size somewhere between 2000-4000 words is sufficient for 95% comprehension of spoken input and a vocabulary size between 6000-9000 words is sufficient for 98% comprehension of spoken input. With that in mind, it is likely that the participants with a lower vocabulary score would watch audiovisual media with Norwegian subtitles more often than their more proficient peers. After all, even though the average vocabulary size of the sample was 6300, there were naturally a number of participants who had a lower vocabulary score and the lowest vocabulary size was 2200. In other words, there were a number of participants that would according to Webb and Rogers (2009a) and Webb and Rogers (2009b) struggle to follow spoken English input in audiovisual media. This explanation

is likely also the reason for the positive influence of watching audiovisual media with English subtitles. Overall, previous research has shown that watching audiovisual media both with and without subtitles is beneficial for vocabulary acquisition (Neuman & Koskinen, 1992; Koolstra and Beentjes, 1999; Rodgers, 2013; Peters & Webb, 2018; Feng & Webb, 2019). The large amount of time the participants spend watching English audiovisual media likely has a positive effect on their vocabulary size and the variance in the results is likely caused by either the less proficient participants being drawn to subtitled audiovisual media or the more proficient participants being drawn to non-subtitled audiovisual media or a combination of the two.

Lastly, despite the rather low mean exposure score for reading, the results nonetheless show a strong positive effect between spending time reading and vocabulary size. In fact, reading was the second highest indicator of language proficiency in the study. These results were somewhat surprising, given that some previous research show that reading has a significant, but limited effect on language proficiency due to it not being a very common extramural activity (Peters, 2018). Although, Busby (2021) did report that reading had a positive effect on the student's vocabulary size. Nevertheless, the fact that reading influences vocabulary size in a positive manner should not come as a surprise given that reading has proven to increase vocabulary size, as discussed in section 2.7.1.

Overall, this study has shown that extramural activities that involves exposure to authentic English input do seem to influence receptive vocabulary size. The independent variables had an adjusted correlation coefficient (R^2) of 0.2618 meaning that the independent variables explained 26.18% of the variation in the dependent variable.

5.3 limitation and suggestions for further research

There were several limitations in this research design that could be improved upon in future research. These limitations were mainly due to the nature of a study appropriate for a master's thesis for the teacher study program, mostly in terms of resources available.

Firstly, this study used a convenience sampling when recruiting participants. For this reason, the participants were all from one school, in one district and were likely not a truly representative sample of the wider population. For this reason, the results of this study should be interpreted with caution as they are not necessarily generalizable. The results can, however, identify and present interesting phenomenon that may later be researched further with the

appropriate resources and funding. Indeed, with the proper resources and funding a study on how extramural exposure affects language proficiency may be carried out in a much larger scale with a truly randomized sample of the population in order to gather data that might be reliably generalizable to the wider population.

Secondly, the current study is a cross-section study on extramural activity and how it affects language proficiency. There are a few methodical limitations to this format in regard to the current study. For example, the participants in the study were asked how much time they spend on the different extramural activities. The data on the participants' daily habits would be more reliable if the researcher had the time and the resources to follow the participants over a period of time and recording their extramural habits. As most people would probably agree, extramural habits such as watching TV, reading and gaming are not permanent and often prone to change. Therefore, as an example, in a cross-section study, participants who periodically spend a lot of time reading, but have not been reading much lately would report that they spend little time reading when the opposite is actually true. Therefore, there is a need for more research in a longitudinal format where habits and extramural exposure is closely monitored and reported over a longer period of time in order to gather optimally valid data.

Thirdly, the present study aims to research how extramural exposure to English affects language proficiency with receptive vocabulary size as the chosen proxy for language proficiency. Although vocabulary is an adequate proxy for language proficiency, the question of how extramural exposure influences language proficiency requires findings regarding other areas of language competence as well. In the current study, vocabulary size was chosen as a proxy because vocabulary size is an important part of language proficiency and a proxy was needed, since testing for more aspects of language proficiency would be too laborious for a study of this nature. Future research should thus also test for other aspects of language proficiency, included other aspects of vocabulary knowledge. The current study employed the Vocabulary Size Test (Nation & Beglar, 2007) and it should be noted that this test only measures receptive vocabulary size and not other areas of vocabulary knowledge such as productive vocabulary size. Furthermore, other important aspects of language proficiency like grammar knowledge, writing, reading comprehension, listening comprehension etc. should also be studied in relation to extramural exposure to authentic English input.

Fourthly, the questionnaire could also be improved with one notable addition. It is well known that children of parents with higher education often perform better in school and that the more educated the parents, the better the children on average perform in school (Statistics Norway, 2020b) and research has shown that parents' educational level positively impacts the

children's language proficiency (Hecht, Burgess, Torgesen, Wagner & Rasotte, 2000; Lindgren & Muñoz, 2013). Therefore, the study could have benefitted from including in the analysis the variable on parents' educational background. Future research on this would be advised to include this.

Lastly, more research is needed on the effects of social media use and language proficiency. Social media use was not analyzed of the current study, because the number of participants who reported using social media was so high that there was too little variance in the data. This might be attributed to a ceiling effect in the questionnaire. Further research focusing on social media use should employ more detailed questions about social media use to possibly uncover more variance within the sample which can be analyzed to determine how social media use affects language proficiency. Furthermore, social media is a slightly narrow expression in regard to incidental language learning, as there are several different social media platforms that differ extensively in how users are exposed to language through them. Additionally, there is likely differences between users in how they use them and what languages they are mostly exposed to. For example, a young L2 learner watching videos on Tiktok will likely have a very different linguistic experience than a young L2 learner looking at pictures on Instagram and the two aforementioned L2 learners will again have a very different linguistic experience than another young L2 learner writing fan-fiction or discussing their favorite TV-show on Reddit. Therefore, a more nuanced look at how social media are used and how they affect language learning would likely be beneficial to uncover how they affect extramural language learning through exposure to authentic English.

6.0 Conclusion

The current study used a linear regression analysis to explore what effects watching audiovisual media with Norwegian subtitles, watching audiovisual media with English subtitle or no subtitle, reading, playing singleplayer videogames and playing multiplayer videogames have on language proficiency in English with receptive vocabulary size as the chosen proxy for proficiency. The study found that the participants (n = 103) are regularly engaged in activities that expose them to authentic English input and spending time engaged with these activities can indeed be a significant predictor of language competence. The study also found variance between the different variables in regard to the extent of the variables' effect on vocabulary

size. The strongest predictor of language competence was multiplayer gaming, although, it was found a significant gender variance and playing multiplayer videogames seemed to affect the boys to a much higher degree than the girls. Furthermore, the study found a positive relationship for playing videogames only up to a certain point, after which the effect stagnates and starts to decline. This suggests that playing videogames is beneficial for language proficiency, but that too much gaming may have a negative effect. The next strongest predictor of language proficiency was reading, followed by watching TV, movies and videos on the internet with English subtitles or without subtitles. No statistically significant relationship was found between playing singleplayer videogames and language proficiency. Finally, the study found that spending time watching TV with Norwegian subtitles was a negative predictor of language proficiency.

The results of the study mostly support previous research on exposure to extramural English's effect on language proficiency, with two notable exceptions. Firstly, the study showed that watching TV with Norwegian subtitles was a predictor of lower vocabulary size. This, however, can likely be explained by the participants with lower proficiency being drawn to TV with Norwegian subtitles. The other exception cannot be as easily explained. The curved linear relationship between playing multiplayer videogames and vocabulary size is in direct opposition to the previous research done on multiplayer gaming done by Sundqvist and Wikström (2015) and Sundqvist (2019). This finding is indeed very interesting and should merit further research.

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Appendices

Appendix 1 – Questionnaire

1. Kjønn?
 - a. Åpent spørsmål: fyll inn
2. Omtrent hvor ofte ser du på TV, serier, film eller vider på internett med engelsk tale OG norsk tekst?
 - a. Aldri
 - b. En gang i blant, men ikke hver uke
 - c. Minst 1 gang i uka
 - d. Flere ganger i uka
 - e. Nesten hver dag
 - f. Hver dag
3. (Om deltakeren svarer (e) eller (f) på (2)): I løpet av en vanlig dag, omtrent hvor mye ser du på TV, serier, film eller videoer på internett med engelsk tale OG norsk tekst?
 - a. Mindre enn 1 time om dagen
 - b. 1 til 2 timer om dagen
 - c. 2 til 3 timer om dagen
 - d. 3 til 4 timer om dagen
 - e. 4 til 5 timer om dagen
 - f. Mer enn 5 timer om dagen
4. Hvor ofte ser du på TV, serier, film eller videoer på internett med engelsk tale med engelsk tekst ELLER uten tekst?
 - a. Aldri
 - b. En gang i blant, men ikke hver uke
 - c. Minst 1 gang i uka
 - d. Flere ganger i uka
 - e. Nesten hver dag
 - f. Hver dag
5. (om deltakerne svarer (e) eller (f) på (4)): I løpet av en vanlig dag, omtrent hvor mye ser du på TV, serier, film eller videoer på internett med engelsk tale MED engelsk tekst ELLER uten tekst
 - a. Mindre enn 1 time om dagen

- b. 1 til 2 timer om dagen
 - c. 2 til 3 timer om dagen
 - d. 3 til 4 timer om dagen
 - e. 4 til 5 timer om dagen
 - f. Mer enn 5 timer om dagen
6. Hvor ofte leser du lengre sammenhengende tekst på engelsk utenom skolearbeid?
(Med lengre sammenhengende tekster menes bøker, aviser, blogger, tegneserier, osv.)
- a. Aldri
 - b. En gang i blant, men ikke hver uke
 - c. Minst 1 gang i uka
 - d. Flere ganger i uka
 - e. Nesten hver dag
 - f. Hver dag
7. (Om deltakerne svarer (e) eller (f) på (6)): I løpet av en vanlig dag, omtrent hvor mye leser du lengre sammenhengende tekst på engelsk?
- a. Mindre enn 1 time om dagen
 - b. 1 til 2 timer om dagen
 - c. 2 til 3 timer om dagen
 - d. 3 til 4 timer om dagen
 - e. 4 til 5 timer om dagen
 - f. Mer enn 5 timer om dagen
8. Hvor ofte spiller du singleplayer videospill? (Spill der du spiller alene)
- a. Aldri
 - b. En gang i blant, men ikke hver uke
 - c. Minst 1 gang i uka
 - d. Flere ganger i uka
 - e. Nesten hver dag
 - f. Hver dag
9. (om deltakerne svarer (e) eller (f) på (8)): I løpet av en vanlig dag, omtrent hvor mye spiller du singleplayer videospill?
- a. Mindre enn 1 time om dagen

- b. 1 til 2 timer om dagen
 - c. 2 til 3 timer om dagen
 - d. 3 til 4 timer om dagen
 - e. 4 til 5 timer om dagen
 - f. Mer enn 5 timer om dagen
10. Hvilke singleplayer spill spiller du? Rams opp
11. Hvor ofte spiller du online multiplayer-spill? Spill der du spiller med eller mot andre over internett)
- a. Aldri
 - b. En gang i blant, men ikke hver uke
 - c. Minst 1 gang i uka
 - d. Flere ganger i uka
 - e. Nesten hver dag
 - f. Hver dag
12. (om deltakeren svarer (e) eller (f) på (11)): I løpet av en vanlig dag, omtrent hvor mye spiller du online multiplayer-spill?
- a. Mindre enn 1 time om dagen
 - b. 1 til 2 timer om dagen
 - c. 2 til 3 timer om dagen
 - d. 3 til 4 timer om dagen
 - e. 4 til 5 timer om dagen
 - f. Mer enn 5 timer om dagen
13. Hvilke online multiplayer-spill spiller du? Rams opp
14. Hvilke sosiale medier bruker du? Rams opp
15. Hvor ofte bruker du sosiale medier?
- a. Svært ofte
 - b. Ofte
 - c. Sjeldent
 - d. Svært sjeldent
 - e. Aldri
16. Hvilket språk bruker du oftest på sosiale medier? (altså hvilket språk snakker eller skriver du)
- a. Bare norsk
 - b. Mest norsk, men noe engelsk

- c. Omtrent like mye norsk som engelsk
 - d. Mest engelsk, men litt norsk
 - e. Bare engelsk
17. hvilket språk leser eller hører du mest på sosiale medier?
- a. Bare norsk
 - b. Mest norsk, men noe engelsk
 - c. Omtrent like mye norsk som engelsk
 - d. Mest engelsk, men litt norsk
 - e. Bare engelsk
18. Hvor ofte snakker du engelsk utenfor skolen?
- a. Svært ofte
 - b. Ofte
 - c. Av og til
 - d. Sjeldent
 - e. Svært sjeldent
 - f. Aldri
19. Hvor ofte skriver du engelsk utenfor skolearbeid
- a. Svært ofte
 - b. Ofte
 - c. Av og til
 - d. Sjeldent
 - e. Aldri
20. Er du født i Norge?
- a. Ja
 - b. Nei
21. (om deltakeren ikke er født i Norge): Når kom du til Norge? Fyll inn
- a. Åpent svar
22. Har du norsk som morsmål? (med morsmål menes språk du har hørt eller snakket siden du var veldig liten)
- a. Ja
 - b. Nei
23. (om de svarer ja på (22): har du mer enn ett morsmål?
- a. Ja
 - b. Nei

24. (om de svarer ja på (23): er engelsk ett av dine morsmål?)
- Ja
 - Nei
25. Om elevene svarer nei på (22): Har du engelsk som morsmål?
- Ja
 - Nei
26. Kan du noen annet språk bedre enn norsk?
- Ja
 - Nei
27. Har en av eller begge foreldrene dine engelsk som morsmål?
- Ja
 - Nei
28. Hvor gammel var du da du begynte å lære engelsk? fyll inn
29. Hvor enig er du i følgende påstand: «jeg er veldig motivert for å lære meg engelsk»?
- Svært enig
 - Enig
 - Hverken eller
 - Uenig
 - Svært uenig
30. Hvor enig er du i følgende påstand: «jeg er motivert for å lære meg engelsk for å få bedre karakterer»?
- Svært enig
 - Enig
 - Hverken eller
 - Uenig
 - Svært uenig
31. Hvor enig er du i følgende påstand: «Jeg er motivert for å lære meg engelsk for å kunne bruke det på fritiden»?
- Svært enig
 - Enig
 - Hverken eller
 - Uenig
 - Svært uenig

32. Hvor enig er du i følgende påstand: «Jeg er motivert til å lære engelsk fordi det er viktig for min fremtidige karriere»?

- a. Svært enig
- b. Enig
- c. Hverken eller
- d. Uenig
- e. Svært uenig

Appendix 2 – Consent form

Vil du delta i forskningsprosjektet «Engelsk utenfor klasserommet».

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å utforske hvordan aktiviteter som tv-titting, videospill og lesing på engelsk påvirker engelskkunnskapene dine. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Dette forskningsprosjektet vil inngå som en del av min mastergrad på NTNU. Formålet med forskningsprosjektet er å utforske hvordan det man gjør på fritiden påvirker engelskkunnskapene deres. Dette vil jeg teste ved å gjennomføre et eksperiment med en norsk 10. klasse, der dere vil svare på noen bakgrunnsspørsmål om deres vaner utenfor skolen, før de så tar en test som tester vokabularet deres i engelsk.

Hvem er ansvarlig for prosjektet?

Institutt for språk og litteratur ved NTNU er ansvarlige for prosjektet

Hvorfor får du spørsmål om å delta

Deltakerne for denne forskningen har blitt plukket ut gjennom et såkalt bekvemmelighetsutvalg. Det vil si at deltakerne har blitt plukket ut på enklest måte for å gjennomføre prosjektet. I dette tilfellet vil det si at vi har snakket med din engelsklærer og avtalt å gjennomføre forskningen i en engelsktime. Derfor har du fått spørsmål om å delta, sammen med resten av din engelskklasse.

Hva innebærer det for deg å delta?

Hvis du ønsker å delta i dette forskningsprosjektet innebærer dette at du gjennomfører en test som anslår omtrent hvor mange ord du kan på engelsk. Deretter vil du bli spurt om noen tillegsspørsmål om deg selv som er viktig for forskningen. Disse spørsmålene vil handle om dine vaner i fritiden, som hvor mye tid du bruker på å se på tv, lese bøker og spille spill, hvor motivert du er for å lære engelsk og hvilket forhold du har til engelsk.

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Dette forskningsprosjektet blir gjennomført på skolen, men inngår ikke i din ordinære undervisning. Det vil ikke få noen negative faglige konsekvenser for deg å trekke deg eller takke nei til å være med i prosjektet.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

Dataen som samles inn vil være helt anonym og det vil ikke være mulig for meg eller noen andre å knytte svarene dine til deg som person. Dataen vil lagres elektronisk og ingen persondata vil lagres etter prosjektet er ferdig

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Opplysningene anonymiseres når oppgaven er godkjent, noe som etter planen er i mai 2021.

Dine rettigheter

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg, og å få utlevert en kopi av opplysningene,
- å få rettet personopplysninger om deg,
- å få slettet personopplysninger om deg, og
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra NTNU har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?

Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Institutt for språk og litteratur, NTNU, ved:
 - Odd-karsten Reiten Nordnes (Masterstudent)
 - o Mail: ok.nordnes@gmail.com
 - o Tlf: 465 46 277
 - Anne Dahl (Masterveileder)
 - o Mail: anne.j.dahl@ntnu.no
 - o 735 96 794
 - Vårt personvernombud:
 - o Thomas Helgesen
 - o Mail: thomas.helgesen@ntnu.no
 - o Tlf: 930 79 038

Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med:
· NSD – Norsk senter for forskningsdata AS på epost (personverntjenester@nsd.no)
eller på telefon: 55 58 21 17.

Med å trykke videre fra denne siden godtar du at opplysningene fra denne undersøkelsen brukes i masterprosjektet slik det er forklart ovenfor.

Appendix 3 - Explaining exposure score

To determine each participants exposure score, their answers from the questions concerning the variables “watching tv with Norwegian subtitles”, “watching tv with English or no subtitles”, “extended reading”, “playing singleplayer videogames”, “playing multiplayer videogames” and “social media use” were converted into a number representing their engagement in these activities. The exposure score was assigned in the following way:

Q1: “Approximately how often do you watch tv, movies or videos on the internet in English with Norwegian subtitles?”.

| Answer: | exposure points |
|--|-----------------|
| 1. Never | 0 |
| 2. Once in a while, but not every week | 1 |
| 3. At least once a week | 2 |
| 4. Multiple times a week | 3 |
| 5. Almost every day | 4 |
| 6. Every day | 5 |

Q2: “During an average day, approximately how much do you watch tv, movies or videos on the internet in English with Norwegian subtitles?”

| Answer: | exposure points |
|-----------------------|-----------------|
| 1. Less than one hour | 0 |
| 2. 1 to 2 hours | 1 |
| 3. 2 to three hours | 2 |
| 4. 3 to 4 hours | 3 |
| 5. 4 to 5 hours | 4 |
| 6. More than 5 hours | 5 |

In cases where the participant’s answered “almost every day” or “every day” in Q1 and therefore triggered Q2, the exposure points from Q1 and Q2 would be added together to form the complete exposure score for the variable “watching tv with Norwegian subtitles”. For example, if a participant answered “almost every day” on Q1 and “2 to 3 hours” on Q2, their final exposure score would be 6/10. If a participant answered “multiple times a week” on Q1, which does not trigger Q2, their final exposure score would be 3/10.

Appendix 4 – tables

Comparison with and without the inclusion of the variables talking and writing

| | B | SE | T | Sig.t |
|--|---------------|-----------|-------------|--------------|
| Gender (Male = 1, female = 0) | -12.3/-12.2 | 5.2/5.2 | -2.39/-2.35 | 0.019/0.021 |
| Tv w/NOR sub | -1.1/-1.0 | 0.4/0.4 | -2.65/-2.58 | 0.009/0.012 |
| Tv w/ENG sub | 1.2/1.0 | 0.4/0.5 | 2.69/2.11 | 0.008/0.038 |
| Reading | 1.6/1.4 | 0.7/0.7 | 2.31/1,96 | 0.023/0.053 |
| Singleplayer videogames | 0.7/0.6 | 0.6/0.6 | 1.20/0.99 | 0.235/0.326 |
| Multiplayer videogames | 0.8/0.5 | 1.7/1.7 | 0.48/0.26 | 0.636/0.796 |
| Polynomial variable (multiplayer*multiplayer) | -0.7/-0.7 | 0.2/0.2 | -3.47/-0.55 | 0.001/0.001 |
| Interaction term (multiplayer*gender) | 5.3/5.6 | 2.0/2.1 | 2.60/2.71 | 0.011/0.008 |
| Talking | */0.2 | */1.0 | */0.22 | */0.828 |
| Writing | */1.0 | */1.1 | */0.94 | */0.349 |
| Constant | 58.8/58.0 | 3.0/3.2 | 18.39 | <0.001 |
| N | 102/102 | | | |
| Adjusted R ² | 0.2618/0.2569 | | | |

*Without *talking* and *writing* / with *talking* and *writing*

Appendix 5 – Relevance for future profession

This master's thesis was written as a part of my teacher training program at NTNU. As a future English teacher, it is very useful for me to have an in-depth knowledge of foreign and second language acquisition to lean on in order to teach my future students properly. As such, this thesis is very relevant for my future profession. Writing this master's thesis has taught me several important things about second language acquisition and the research conducted for this thesis has shown me that especially multiplayer gaming, watching tv and reading are great sources of exposure to authentic input which is vital for successful English learning. There is a tendency in the ESL classroom to rely on and use reading as the main source of input for the

L2 learners. This makes sense, as there has been much research done on the benefits of reading for language acquisition. As such, I do not necessarily believe that replacing English with other activities that involve exposure to English, such as audiovisual content or gaming, is necessarily the right step to take. However, it is useful to be aware that gaming and audiovisual content can be a valid substitute. One example of how this may be useful knowledge is in regard to teaching and differentiated instruction. Every student's right to instruction adapted to each individual's circumstance is a very important part of the curriculum in Norwegian schools (Kunnskapsdepartementet, 2020). Therefore, the knowledge of other types of exposure that lead to vocabulary learning may be very useful when tailoring language learning, and more specifically vocabulary learning, to the individual students in my future classes.

