The role of input in early second language acquisition

A study of the long-term effects of initial extra English input on Norwegian 4th graders' receptive vocabulary

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Abstract

This study aims to investigate the long-term effects of initial extra English input in early second language learners on receptive vocabulary. It builds on a study conducted by Dahl & Vulchanova (submitted), where a group of Norwegian pupils in their first year of English instruction received systematic extra English (EE) input in and outside English classes, but within the school environment and without increasing teaching hours. Compared to a group in a different school where only normal English (NE) input was provided, the EE input group showed a substantial growth in vocabulary size throughout the school year (Dahl & Vulchanova, submitted). The systematic extra English input focus was discontinued after the pupils' second year of schooling.

The current study tested the receptive vocabulary of the EE exposure group and that of a NE exposure group two years after the discontinuation of the EE input focus. 44 monolingual children in two schools were tested using the Peabody Picture Vocabulary Test (Dunn & Dunn, 2007). The results indicate that, contrary to the development seen in 1st grade, the two groups now develop at a similar and almost parallel rate in terms of receptive vocabulary. Although the EE exposure group retains a slightly higher mean raw score, an ANOVA analysis shows that the difference in raw score of the two groups is not statistically significant. Based on reports from parents, the ANOVA was also conducted to investigate whether external factors of input such as media exposure and stays in countries where English is an official language had an impact on the pupils' receptive vocabulary. The analysis did not yield any statistically significant results. The results suggest that it is indeed the discontinuation of the EE input that has resulted in the change of receptive vocabulary development, and that the initial vocabulary boost the EE exposure group's participants obtained in 1st grade does not seem to provide a lasting advantage.

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1. Introduction

Many researchers on language acquisition agree that early onset is important when acquiring a second language (L2). Norwegian school children start learning English in first grade, at 5-6 years old. This early onset should then provide a good starting point for learning their L2.

However, research suggests that the learning outcome for these young children is not adequate during the first year of formal instruction. Dahl & Vulchanova (submitted) conducted tests on Norwegian children in first grade, comparing their vocabulary skills at the beginning of formal teaching to their levels eight months later. Groups from two demographically similar schools were tested. In the first school, the teachers were instructed to continue teaching as normal, implying that most of the instruction was done in Norwegian. In the other school the teachers were to increase the use of English input, both in lessons of English as language of instruction and in simple instructions outside of English class such as in the corridor, in morning meetings, and when reading aloud. The intention of the study was to find out if this "modest increase of input" would have a positive effect on the development of the children's vocabulary. Dahl & Vulchanova point out that "younger learners excel at implicit learning, whereas older learners outperform them in explicit learning. If this is the case, then what younger learners need is above and beyond all else *input* - not explicit instruction and formal training." (Dahl & Vulchanova, submitted).

Norwegian children are required to participate in a total of 138 hours of English teaching between first and fourth grade (Utdanningsdirektoratet 2013). Distributed evenly between the four years, and between the minimum of 38 weeks of the school year (Utdanningsdirektoratet 2013), this means that the children receive less than an hour of English per week during their first four years in school. This adds to the problem of qualitatively lesser input discussed above. But even though less than an hour per week gives very little time to learn a new language, increasing teaching hours is too ambitious for a research project. However, by increasing the amount of input the children get during their English lessons, and by adding some extra input outside of the English classroom, the hypothesis of Dahl & Vulchanova was that the children would benefit from this.

The results of Dahl & Vulchanova's study indicated that the children with an increased exposure to

English in and outside of English classes had a significant increase in vocabulary during the year, while the children who continued with their ordinary level of input showed a statistically insignificant increase. This suggests that the few hours, with mostly Norwegian as the language of instruction, is not an effective way of securing early acquisition of L2 English.

The current study investigates the effect of this initial extra English (EE) input three years later, as the EE group only kept this focus during the first two years of the teaching. The hypothesis is that the "boost" of English input would have a lasting positive impact in their vocabulary skills. However, it is also hypothesized that the lack of extra input in the third and second grades would have caused the growth rate of their vocabulary to decrease, and become similar to that of a group with normal English (NE) conditions.

2. Theoretical background

2.1. What is a second language?

The most apparent point of reference to help explain what a second language (L2) is, is that of the first language (L1). A first language is normally regarded as a synonym of what we call "native language" or "mother tongue", and is generally defined as the language that is "acquired during early childhood" (Saville-Troike 2006:4). In the case of bilingual children, two or several languages will classify as first languages. A second language is a language learned after the first language(s). As with L1, the term L2 may include just one, or indeed several languages, "even though it may actually be the third, fourth or tenth to be acquired." (Saville-Troike 2006:2). Rod Ellis underlines an important difference between the acquisition of a first language and a second language by stating that "L2 learners bring an enormous amount of knowledge to the task of learning an L2" (2002:5). Conversely to L1 acquirers they have already learned (at least) one language. The already existing linguistic knowledge in the mind of the native speakers will affect their understanding of linguistic concepts of the L2, which results in a learning process that is necessarily different from that of a first language. In addition, being older than children learning their native language, L2 learners "possess general knowledge about the world which they can draw on to help them understand L2 input" (Ellis 2002:5). While L1 acquirers will need to spend time on for instance mapping which characteristics a creature needs to possess to be included in the concept of "dog" (in contrast to the characteristics of "cat", "giraffe" or "book"), an L2 learner has already understood many of these concepts, and can use this knowledge when learning new words.

Vivian Cook (1999) emphasizes that although frequent, comparisons of the level of attainment of the L2 learner to the native speaker L1 should not be made in language learning. He states that pointing to the L2 learner's "failure to achieve native-speaker competence" is an impossible comparison because "adults could never become native speakers without being reborn" and because native speakers are "people who know their language perfectly" (Cook 1999:187-189). Instead, with the knowledge the L2 users bring from their L1 it should be recognized that they are "successful multicompetent speakers, not failed native speakers" (Cook 1999:206).

2.2. The role of age in second language acquisition

There is general agreement among researchers that age does play an important role in language acquisition, in that children tend to learn languages with more ease, and with a more successful ultimate attainment than do adults. An illustrative example of this is the case of deaf children and adults acquiring sign language, as "the deaf are virtually the only neurologically normal people who make it to adulthood without having acquired a language" (Pinker 1994:37). Pinker points to examples where deaf parents have not, due to social norms, acquired sign language growing up, but have later made an effort to learn it as adults. Even though they have not been able to learn sign language fluently as adults, their child – despite having no other sources of sign language input than the parents' grammatically imperfect communication – has been more successful than its parents in acquiring the language (Pinker 1994:37-18). The same is experienced in spoken language: While adults generally do not acquire their second language to the same fluency as those who speak it as their first language, children, even those who are adopted and have not been exposed to the language during the first couple of years of their life, seem to acquire the language with the same success as any native speaker. Pinker notes that "even the adults who succeed at grammar often depend on the conscious exercise of their considerable intellects, unlike children, to whom acquisition just happens" (Pinker 1994:291).

One theory attempting to explain this tendency is the Critical Period Hypothesis. The Critical Period Hypothesis suggests that there is a critical period in the development of all humans within which they have to start acquiring a language to potentially reach successful ultimate attainment. Lenneberg (1967) was the first to formulate this hypothesis, claiming that "automatic acquisition from mere exposure to a given language seems to disappear [after puberty], and foreign languages have to be taught and learned through a conscious and labored effort. Foreign accents cannot be overcome easily after puberty." (in Hyltenstam & Abrahamsson 2003:540) Lenneberg explained this effect by the "completion of the hemispheric lateralization", and restricted the critical period of language acquisition to the period between age 2 and puberty (Hyltenstam & Abrahamsson 2003:539).

Even though researchers generally agree that sensitivity to language acquisition is connected to the age factor, the exact period within which this is critical is contested. While some studies suggest differences of ultimate attainment when acquisition of sign language has been initiated at age 4 and at age 6, others have suggested that the critical period for phonology terminates at age 1 with insufficient phonology

resulting in "flawed semantic and syntactic capacities" (Hyltenstam & Abrahamsson 2003:543-544). An experimental study of speech perception through visual language discrimination showed that monolingual infants by watching silent talking faces were able to discriminate between languages at the age of 4 and 6 months, but no longer at he age of 8 months, suggesting that the critical period for this ability had passed (Weikum *et al* 2007). Pinker suggested a broader and more general definition, tying several of the existing hypotheses together, by stating that "acquisition of a normal language is guaranteed for children up to the age of six, is steadily compromised from then until shortly after puberty, and is rare thereafter" (Pinker 1994:293).

According to DeKeyser (2000), an important difference concerning the age factor in language acquisition, which might be seen as a specification of the Critical Period Hypothesis, is the manner in which learners profit the most. He points to results indicating that "somewhere between the ages of 6-7 and 16-17, everybody loses the mental equipment required for the implicit induction of the abstract patterns underlying a human language" (DeKeyser 2000:518). As a consequence of this cognitive change, younger children are most effective in language acquisition when being exposed to implicit linguistic input around them, as opposed to explicitly being taught grammar rules and vocabulary. Older learners however, seem to benefit from additional explicit L2 instruction. It seems important to take this difference of effectiveness of learning mechanisms into account when teaching an L2 to children. For younger children then, the importance of input should be taken advantage of during early years, while the focus upon explicit instruction should be set to a later stage.

2.3. Input as a central aspect of learning a second language

The importance of language input is central in this study. The claim is that even though both groups receive instruction in English from a relatively early age, increased input, or exposure, of the target language in class will contribute to lasting better English skills, measured in increased vocabulary. That input is an important factor in language learning is apparent especially when we look at cases where the language learner has the opportunity of natural immersion through living in the language community. Singleton (1995, in Fullana 2006) estimates that in order to attain as much input as a second language learner would during one year in a second language naturalistic setting, more than 18 years in a formal instructional setting would be required. He underlines that "no one would want to postulate a literal equation between a given quantity of input over 12 months and the same amount of exposure over 18

years, but the point is that when comparing different categories of language learners one does always have to keep in mind the varying relationship between real time and exposure time." (Singleton 1995, in Fullana 2006:43). Naturally, quantity of input is important to be able to learn for example vocabulary from a wide variety of domains.

Gass & Selinker (1994) point to a distinction made by Corder in 1967 between the two notions of *input* and *intake*. They describe input as "all exposure to the language", including input that "goes in one ear and out the other". Intake however, is defined as "what is actually internalized". This distinction underlines that not all input leads to direct language learning. Gass & Selinker emphasize that "without understanding the language no learning can take place. Although understanding alone does not guarantee that learning will take place, it does set the scene for learning to take place." (1994:200) For the input to be effective for the second language learner, then, it seems important that (at least a part of) the input presented is adapted to the level of understanding in the learner.

Krashen (1981) supports this view, and presents three categories of adapted input from which the second language learner can benefit: "teacher-talk", "foreigner-talk", and "interlanguage" input. The first is defined as "the classroom language that accompanies exercises, the language of explanations in second language and in some foreign language classrooms, and the language of classroom management." Foreigner-talk is "the simplified input native speakers may give to less than fully competent speakers of their language in communicative situations." Gass & Selinker further elaborate on this way of speaking as including "slow speech rate, louder speech, long pauses, simple vocabulary (e.g., few idioms, high frequency words), repetitions and elaborations, and paucity of slang" (1994:199). By these characteristics, foreigner-talk seems to have several features in common with what is called child-directed speech – the manner of speaking that is often used by adults when talking to very young native speaker children. The third category, "interlanguage" is the "imperfect" second language that the students speak among them, for example when instructed to practice speaking the target language in class. Krashen suggests that "simple codes like teacher-talk and interlanguage-talk are extremely useful in attaining initial levels of fluency" (1981:124), while "foreigner-talk may provide a bridge to high intermediate and advanced levels of competence." (1981:123) As the children who have been tested for the current study are indeed still on their way to attain "initial levels of fluency" we expect that they benefit greatly from teacher-talk and interlanguage-talk.

More input, especially at levels where the speech has to be carefully adapted to the children's level of understanding, will necessarily lead to more frequent encounters with certain words and language constructions. Nick Ellis (2002) emphasizes the importance of such frequency in language processing. He asserts that

> *Language learning is the associative learning of representations that reflect the probabilities of occurrence of form-function mappings. Frequency is thus a key determinant of acquisition because "rules" of language, at all levels of analysis (from phonology, through syntax, to discourse), are structural regularities that emerge from learners' lifetime analysis of the distributional characteristics of the language input.*   *(Ellis 2002:144)*

Ellis stresses that "learners have to *figure* language out", and that the way they can do this is by frequent exposure to the target language. Through this exposure, the learner frequently encounters the linguistic features of which the language is composed. According to Ellis, the more frequently the construction has been encountered, the more readily the learner will recognize or produce it: "We may not be counting words as we listen or speak, but each time we process one there is a reduction in processing time that marks this practice increment, and thus the perceptual and motor systems become tuned by the experience of a particular language." (Ellis 2002:152) Importantly, he does not claim that second language learners should *only* learn by means of hearing the language. He emphasizes the results of numerous studies showing that "language acquisition can be speeded by explicit instruction", such as that typically practiced in school (Ellis 2002:174). However, the two methods should be combined, as "pedagogical rules are only properly effective when demonstrated in operation with a number of illustrative exemplars of their application" (Ellis 1993 in Ellis 2002:175).

2.4. Vocabulary as an indicator of language proficiency

To measure the children's level and growth of the second language in the current study, it is the size of their vocabulary that has been tested for. Clarke (2003) points to the fact that "words come first in language acquisition. […] Without words, there would be no sound structure, no word structure, no syntax. The lexicon is central in language, and central in the acquisition of language." (1) Alan Juffs supports this view, stating that "no matter one's theoretical perspective, the lexicon is a key component of language" (2009:181). Being both a central and an initial component of language learning, the size of the vocabulary is commonly seen as a good indicator of language skills.

Within the field of vocabulary, a common distinction is that drawn between active and passive vocabulary. Traditionally, the passive vocabulary is thought to consist of all the words which the speaker can recognize. The active vocabulary on the other hand, consists of the words that "can be produced at will" (Gass & Selinker 1994:272). This distinction is closely connected to "the well-established fact from child language acquisition studies that comprehension normally precedes production." (Krashen 1981:108). Even though the child has encountered a word through input, and is able to recognize it on a second encounter, it is not a given that the world is familiar enough for the speaker to be able to think of it and produce it in a second language production situation.

Another distinction to be drawn when it comes to comprehension of vocabulary, it that of potential and real vocabulary. Real vocabulary "consists of all the words the learner is familiar with after (and because of) exposure" (Gass & Selinker 1994:272). Potential vocabulary, however, "consists of words a learner will recognize even though they have yet to be seen in the second language" (Gass & Selinker 994:272). An example of such words is that of cognates, which are words that are similar in form to their translation equivalent in the first (or other acquired) language, so that the learner can guess its meaning even though it is the first time he encounters it in the second language. One occurrence of cognates from the testing of the current study was when testing for the comprehension of the English word "hopping". It became clear that this was only part of many of the pupils' potential vocabulary when they were presented this word and four illustrations to choose from. Several of the pupils expressed discontentment when presented with the word, asking "Do you mean 'jumping'?" or assuring/correcting the experimenter: "...but it *is* called 'jumping'." In English and Norwegian, "hopping" and its translation equivalent "hoppe" are cognates. Apparently, several of the pupils had only been exposed to the word "jumping" and never the word "hopping". Still, they all pointed to the correct illustration of a girl playing hopscotch.

2.5. Background on the situation of Norwegian children and English input

According to Education First's (EF) English Proficiency Index (EPI), having tested 1.7 million adults above 16 years of age from 54 countries and territories, Norway is among the five countries in the world where the inhabitants have the highest proficiency of English (Education First, 2013). There might be several contributing reasons for this. First of all, exposure to English language through media

is substantial, and presumably much higher than in countries where dubbing of TV series and films is the norm. Children and adults in Norway hear and see English in their daily lives through media such as TV series, films, advertisements, video games, music, books and cartoons. Compared to other foreign languages, English is by far the most used in media (Simonsen, 2005). In a questionnaire that the parents filled out about the children tested for the current study, they reported that their children were exposed to a mean of 4.42 hours of English per week outside school through such media, with the highest number being as much as 10 hours per week. Compared to the one hour of English formal instruction per week they get in school, this might indeed have an impact on their overall English language skills.

As mentioned, Norwegian children start learning English at an early age (5-6), and continue learning the language in school until at least the age of 14-15, many until they are 18-19. This presumably contributes to their rather successful ultimate attainment. At the end of the obligatory first ten years of instruction they have had 593 hours of English instruction. However, distributed between ten years and 38 weeks of teaching per school year, this only constitutes a mean of 1.5 hours of instruction per week. Compared to the weekly mean of 4.42 hours for which the (still young) participants of the current study are exposed to English through media, we see that the weekly time spent on English learning in school is quite low. In addition, the hours are distributed in a manner that provide fewer hours of instruction for the younger children (1st-4th grade: a mean of 0.9 hours per week), and an increase of instruction time as they get older (5th-10th grade: a mean of 2 hours per week) (Utdanningsdirektoratet 2013). This distribution might not be ideal, taking into account the age factors of language acquisition described above (Chapter 2.2), such as Pinker's suggestion that language acquisition is "steadily compromised from [the age of six] until shortly after puberty, and is rare thereafter." (Pinker 1994:293)

2.5.1. English in Norway – a foreign or a second language?

The distinction between the terms "second language" and "foreign language" has been disputed in recent years, for instance by Rod Ellis who claims that "'second' is not intended to contrast with 'foreign'" (2002:3). However, as several researchers (e.g. Gass & Selinker; Saville-Troike) and also the Norwegian curriculum do distinguish between these terms, it is useful to look at how English should be categorized. Saville-Troike (2006) defines a "second language" as "typically an official or societally dominant language needed for education, employment and other basic purposes". A foreign language,

on the other hand, is defined as "one not widely used in the learners' immediate social context which might be used for future travel or other cross-cultural communication situations, or studied as a curricular requirement or elective in school, but with no immediate or necessary practical application" (Saville-Troike 2006:4).

Looking at the role of English in Norway today, it is clear that by these definitions it falls within the term of "second language". The official language in Norway is Norwegian, and this is also the language that is mainly used within the mandatory levels of education. However, in higher education a large amount of especially the course readings are in English, and "the students are expected to acquire material in English as readily as that in Norwegian." (Ljosland 2008:66, my translation). Also, many students choose to write their thesis in English, for it to be more accessible internationally, or simply because it seems more natural after having acquired much of the knowledge through English literature. Ljosland reports that in Norway's three largest universities, a mean of 88.5% of all doctorate theses published in 2007 are written in English, with the percentage in NTNU being as high as 93% (Ljosland 2008:70). Regarding employment, knowledge of English is also important. When asked to respond to the statement "we expect new employees to be able to understand and to make themselves understood in English", 86% of export corporations and 79% of import corporations agreed (Simonsen 2008:2). Of all Norwegian businesses, 8% report to have English as a working language (Simonsen 2008:2).

In Lambine's 2008 article with the title "English just isn't a foreign language anymore", she argues that the increased exposure the children get outside the school environment has changed the way they think about the language. Pupils in their last three years of schooling (at ages 16-19) were asked to respond to the statement "I consider English to be more like my second mother tongue than my first foreign language". The pupils largely agreed to this, distinguishing it from other foreign languages they had started to learn at a later stage, such as French and German (Lambine 2008; Simonsen 2008). This distinction between English and other languages taught in school is reflected in the curriculum for Norwegian schools. Although one part of the curriculum treats e.g. the aims and the set amount of teaching hours for "foreign languages", English is not included in this category, but rather has a separate category simply called the curriculum for English (Utdanningsdirektoratet 2013).

3. Methods

The current study is based mainly on quantitative methods, as the material is obtained by a standardized vocabulary test with clear right and wrong answers. A questionnaire is also used to obtain information from parents on the language specific background and environment of the children. This questionnaire gathered both quantitative and qualitative information: in some of the boxes the parents were requested to simply tick off or write a number, while in others they were encouraged to make comments or elaborate on the situation. Postholm & Jacobsen underline that the quantitative method of gathering information is very useful when studying a large number of participants, but that these methods could often be used in combination, and should be seen as complementary (2011:41-42). The study is also of a deductive nature, as the research is based on specific hypotheses and theories.

3.1. Participants

The participants in this project were 44 Norwegian monolingual fourth-graders from two schools, with ages ranging from 9:0 (9 years, 0 months) to 10:2. Initially, a total of 81 pupils from the two schools received a parental consent form (Appendix 1 & 2) to be filled out by their parents and returned to school. The parents who agreed to their children taking part in the testing then received a questionnaire (Appendix 3) including questions about date of birth, whether their child was bilingual; approximately how many hours of English the child was exposed to English outside school per week, and through which media; which and how many foreign countries the child had visited, and at what age; and if there were any medical or other conditions that could be thought to have an impact on the child's language learning progress. Only the test results from the children who handed in both of these forms were taken into account in this study.

3.1.1. The extra English exposure conditions group

The extra English (EE) exposure group was the same group that was tested by Dahl & Vulchanova three years earlier. Of the 31 participants whose results were used in Dahl & Vulchanova's study, 2 children had moved. A parental consent form was delivered to the remaining 29 pupils (who were in three different classes) and, for a greater chance of a sufficient number of respondents, an additional 13

randomly selected pupils (the remaining 13 pupils in one class). All the pupils had had the same EE focus during the first two years of school. Of the 42 forms distributed, 32 were returned with a positive answer to participate in the testing. After the testing, the results of one participant were dropped because the questionnaire was not returned, two because they were bilingual, one because she was not a pupil at that school during the first two years, at the time of the EE focus, and three because their results were significantly lower than the others' (outliers). The final number of participants from the EE school was hence 25, with a mean age of 9:8. Of these participants, 12 were male and 13 were female.

3.1.2. The normal English exposure conditions group

The normal English (NE) exposure school that participated in Dahl & Vulchanova's study did not respond to our request of participating again. However, we assume that both this and the NE school that participated in the current study are representative of average Norwegian schools when it comes to English teaching. Their teacher reported that the classes have had no particular EE focus during their first four years of instruction. All 39 children in fourth grade received parent approval forms, of which 27 were returned. Unfortunately, after testing, and despite many reminders from the teachers, seven did not return the questionnaires. One pupil's results were dropped because of bilingualism, and there were no outliers. In total, the results of 19 NE participants were included in this study, with a mean age of 9:8. Of the included, 11 participants were male, and 8 were female.

3.1.3. Background on the schools and the nature of the input

The schools tested for this study are both situated in suburban areas of Trondheim, which is the third largest city of Norway. The areas they live in are socioeconomically very similar, so this is unlikely to have an effect on the result (Trondheim Høyre, 2012). Looking at the results from the 2010 national tests on 5th graders in English, the EE exposure school scored slightly below average for the schools in Trondheim, while the NE exposure school scored above average (Trondheim Høyre, 2012). Compared to the school of the NE exposure group that participated in Dahl & Vulchanova's study, the NE exposure school of the current study scored slightly higher. Because these tests are not conducted until 5th grade, the participants of this study have not yet participated in the national tests for English. However, the results might be an indicator of the general level of English in those schools.

In both Dahl & Vulchanova's NE exposure group and in that of the current study, the teachers were non-native speakers of English. In both cases they reported providing no extra English input outside the English classes. Teaching hours were consistent with the national average of 138 hours distributed by 38 teaching weeks per year for the first four years of learning, constituting on average less than an hour of teaching per week. In teaching they used both Norwegian and English.

Due to the limited scope of these research projects, teaching hours for the EE exposure group were not increased compared to the NE exposure group and the national requirements. However, for Dahl & Vulchanova's study in 1st grade, the teachers of the EE exposure group "agreed to use English more extensively with the children in and outside of English class, such as for morning meetings, simple instructions during the day, and reading aloud." (Dahl & Vulchanova, submitted). The English classes focused on providing input, 5-10 minutes of the daily morning meetings were conducted in English, and some simple classroom management was provided both in English and with its Norwegian translation. For the current study, with vocabulary tests conducted towards the end of 4th grade, the teachers of the EE exposure group report that they still speak a fair amount of English in English classes, but that the focus on input outside class has ceased. The teachers of the EE exposure group are the same as those who participated in Dahl's study, and consist of two non-native speakers of English, and one native speaker who also speaks Norwegian fluently and uses Norwegian when teaching other subjects. The native speaker teacher reports that the part of the group that she normally teaches in other subjects might still have received some input outside English classes in 3rd and 4th grade, but that this does not occur as often and as structured as with the input they got in 1st and 2nd grade.

3.2. Procedure

3.2.1. The PPVT-4 test

For the testing Form B of the Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4) was used (Dunn & Dunn, 2007). The test is designed to assess the processing of receptive vocabulary. This implies that the comprehension performance will not be inhibited by difficulties with pronunciation, orthographic skills in the foreign language et cetera. It will also be able to test for words that are present both in the active and in the passive vocabulary of the pupil. As the child is allowed and encouraged to guess if he is not certain of the answer, potential vocabulary might also be included in

the test results.

The test was conducted individually for all the children. In testing, the experimenter pronounces a word as the child is subjected to four drawings showing different objects or scenarios. The child is then encouraged to point to the drawing that corresponds to the word that is pronounced. The child has the opportunity to ask the experimenter to repeat the word if anything is unclear. The words are organized in 19 sets of 12 words in each. Each set has a "start age" of between 2:6 (2 years, 6 months)-3:11 (Set 1), and 19-adult (sets 14-19). As these start ages represent the start age for native speakers of English, which most of the children tested in these experiment are not, the test was initiated at Set 1 for all the children. The testing continues until the child gets 8 erroneous answers in one set. Raw scores are then calculated by subtracting the total number of errors from the number of the ceiling item (the last word in the last set), so that the score constitutes the total amount of right answers by that child throughout the test.

The experimenter does not indicate overtly to the child when mistakes are made, but simply proceeds to the next word. The child is not aware of the threshold level of 8 words in one set of 12, nor the division of words into sets. The testing is hence intended to maintain (or boost, by encouraging comments) the children's confidence of their English performance. The tests were conducted in a quiet, well illuminated room, to ensure good conditions both for hearing the stimulus words and for seeing the pictures.
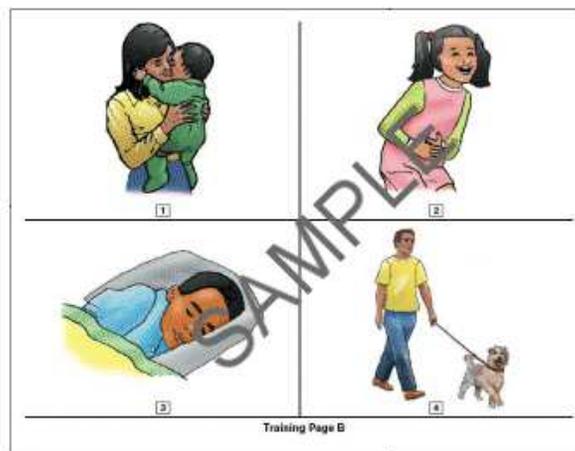
Illustration 1: An example of a set of four pictures in the PPVT-4 test. The child should point to the drawing that illustrates the stimulus word.

3.2.2. Testing for other possible contributing factors to vocabulary growth

A questionnaire was filled out by all the parents whose children participated in the study (Appendix 3). The objective of this was to investigate whether there were other factors of English input outside school that could affect the children's vocabulary scores. First, the parents were asked whether their child was familiar with any other language not learned in school. Test results for children who already had a high level of English before the initiation of formal teaching in school were excluded from this study. The same was done in cases where the child had a higher level of another language than of Norwegian. The parents were also asked to include information about problems with vision or hearing or other diagnoses which could be thought to affect the child's language learning. None of the participants were excluded on these grounds.

English exposure through media

Second, parents were asked to report hours per week and media by which their child was exposed to English outside school. Examples of possible media provided in the questionnaire were TV programs, movies, books, cartoons, music, computer games or other computer usage. For the statistical analyses in SPSS, the hours of exposure reported were divided into three values: Value 1: 0-3 hours per week, value 2: 4-7 hours per week, and value 3: 8-10 hours per week. From the answers on the questionnaires 15 children were included in value 1, 18 in value 2, and 6 in value 3. 5 participants had no specification of hours on the form. When testing, the reported media were divided into two values. Value 1 included interactive media (mainly games and computer usage), where the child has to understand and respond according to the language they meet. 24 children were reported to use such media. Value 2 included non-interactive media, such as TV, music etc, where they can listen or watch without a requirement of understanding to proceed. 12 children were reported to use only these media. 8 questionnaires were returned with no specification of media type. The hypothesis was that interactive media would have a larger effect on vocabulary learning due to the greater requirement to understand the language input.

English exposure through traveling

Another hypothesis was that stays in foreign countries would have an effect on vocabulary size. The answers in the questionnaires were divided into two values: Value 1 included those who had visited countries where English is the official language, for a duration of 7 days or more. 11 children were

included in this category. Value 2 included all those who had visited countries with other languages than English as their official language, or who had visited English-speaking countries for a duration of less than 7 days. 32 participants were included in this group. One questionnaire did not include information of foreign travels. The results will be presented in the following chapter.

4. Results

4.1. Results from the PPVT-4 test

4.1.1. Mean raw scores

As reported in Dahl & Vulchanova (submitted), the difference in mean raw score was very small at the time of the pre-test in 1st grade. The results of the post-tests 8 months later however, showed that while the NE exposure group's vocabulary levels had increased very little, and to no statistically significant degree, the EE exposure group showed a significant and substantial growth. These results are shown in Table 1 and Figure 1 below.

Mean raw scores	1st grade pre-test	1st grade post-test	Mean raw score growth per year first 8 months
NE	23.72	29.14	*8.13*
EE	25.39	44.10	*28.07*

Table 1: Mean raw scores for the NE and EE exposure groups on the pre-test at the start of 1st grade, and on the post-test 8 months later. "Mean score growth per year first 8 months" illustrates the growth of the mean raw score per year, assuming that the children acquire words at the same rate during the whole first year as they did during the eight months of the testing period.
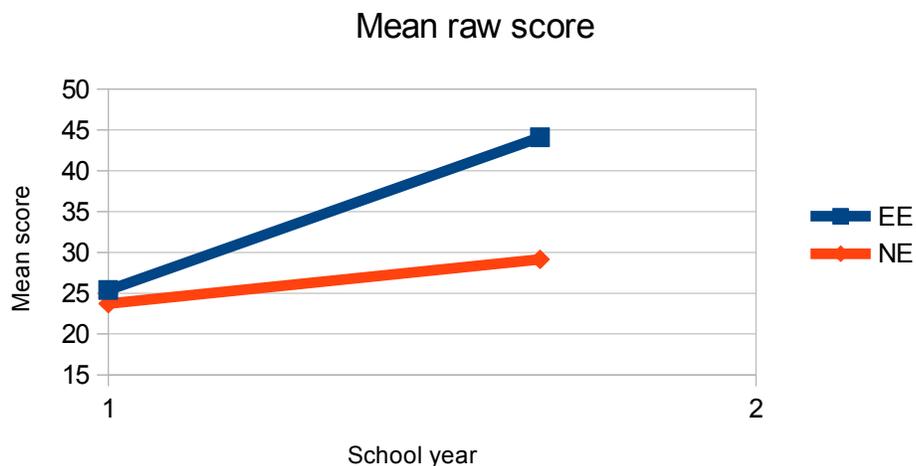
Figure 1: Mean raw score development from the 1st grade pre-test to the 1st grade post-test 8 months later.

The test results for the two groups of the current study demonstrate a very different development than that shown for the first eight months. These are presented in Table 2 and in Figure 2 below.

Mean raw scores	1st grade pre-test	1st grade post-test	Mean raw score growth per year first 8 months	4th grade test	Vocabulary growth per year 1st post -4th grade
NE	23.72	29.14	8.13	93.42	21.43
EE	25.39	44.10	28.07	102.0	19.30
Raw score difference	1.67	14.96	19.94	8.58	2.13

Table 2: Mean raw scores in the 1st grade tests and the 4th grade test, and the mean vocabulary growth per year.

The development from the post-test in Dahl & Vulchanova's study to the tests in 4th grade shows a much more parallel vocabulary growth in the two groups relative to each other. While the difference between the mean raw scores in 1st grade was substantial (28.07 and 8.13, with a difference of 19.94 points), the current results show a very small difference in vocabulary growth per year between the two groups from the 1st grade post-test until the 4th grade test (21.43 and 19.30, with a difference of only 2.13 points). This parallel growth suggested in Table 2 is illustrated by Figure 2 below:
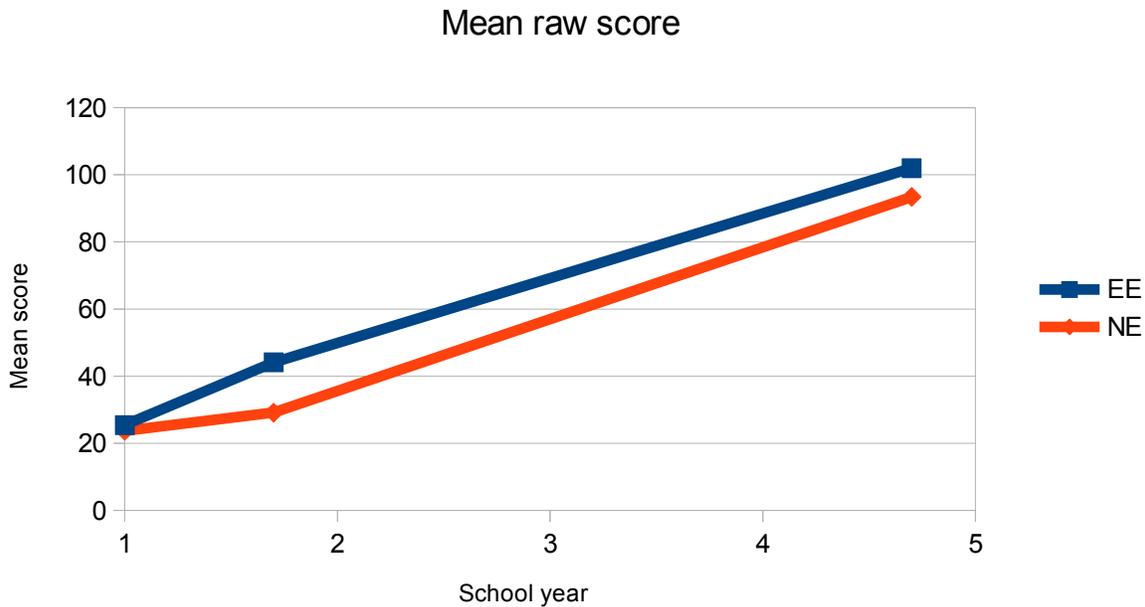
Mean raw score

Figure 2: The first two sets of data points show the mean raw score development from the 1ˢᵗ grade pre-test until the 1ˢᵗ grade post-test 8 months later. The third set of data points shows the mean raw score for the current 4ᵗʰ grade test.

A four-way factorial ANOVA analysis was conducted in SPSS to investigate the relationship between the 4ᵗʰ grade mean raw score in the NE and the EE exposure groups. The analysis shows that the difference in mean raw scores between the two groups is not statistically significant, with $F(1, 14) = 0.114$, $p = 0.741$ (Appendix 5).

4.1.2. GSV scores

The PPVT-4 Manual (Dunn & Dunn 2007) states that Growth Scale Values (GSV) are very useful for measuring change in vocabulary performance over time, when using results from any of the PPVT versions. The scores measure "an examinee's vocabulary with respect to an absolute scale of knowledge" (Dunn & Dunn 2007:21), that is, compared to the examinee's previous results and not their peers. This means that it does not matter to which degree the examinee or the group is developing in accordance to their age peers, only how their own raw score develops over time. The scores are found by conversion from the raw score in "Table B.5 Age Equivalentes and GSVs Corresponding to Raw Scores" in Dunn & Dunn (2007:183). The GSV scores for the two tests in 1ˢᵗ grade and for that

conducted in 4th grade, including the differences between the consecutive tests can be seen in Table 3:

GSV scores	1st grade pre-test	1st grade post-test	Difference, pre-post 1st	Statistically significant difference?	4th grade test	Difference post 1st-4th	Statistically significant difference?
NE	84	85	1	No	136	51	Yes
EE	89	101	12	Yes	142	41	Yes

Table 3: Growth Scale Value scores for the NE and the EE exposure groups in the three tests, and the calculated GSV score differences between the tests.

An increase in GSV score over time indicates an improvement in test performance, and hence an increase in vocabulary size of the group. The PPVT-4 Manual states that for ages 2:6-12, any difference that is larger than 8 GSV points is a statistically significant difference (p<.10), although "the size of a difference required for statistical significance is smaller for group averages than for individual scores" (Dunn & Dunn 2007:205-206). We see from the results and differences in Table 3 that the increase in GSV for the EE exposure group in 1st grade was above 8 GSV points (12 GSV points), and hence a statistically significant increase. For the NE exposure group however, we can not say that the difference between the results in the pre- and the post-test (1 GSV point) was statistically significant, even though it is a group average and not an individual score. Regarding the difference from the 1st grade post-test until the 4th grade test however, the increase in GSV scores for both groups is statistically significant and substantial (51 and 41 GSV points).

4.1.3. Age equivalents

The chronological age for each participant was calculated according to PPVT-4 standards: by subtracting the months and years of the examinee's birth date from those of the test date (Dunn & Dunn 2007:7). The average chronological age for both groups was identical in both the tests conducted by Dahl &Vulchanova in 1st grade, and those conducted in 4th grade in the current study. By use of Table B.5 in the PPVT-4 Manual (Dunn & Dunn 2007:183), the age equivalent corresponding to the mean raw score can be found. This age equivalent indicates the mean age at which native speakers of English obtain a certain raw score. Although the examinees of the current study are not native speakers of English, these age equivalents can be useful to investigate vocabulary growth in time relative to that of native English speakers. The age equivalents are shown in Table 4.

Age equivalent	1st grade pre-test	1st grade post-test	Difference, pre-post 1st	4th grade test	Difference post 1st-4th
Chronological age, both groups	6:1	6:9	0:8	9:8	2:11
NE age equivalent	2:4	2:7	0:3	5:7	3:0
EE age equivalent	2:5	3:3	0:10	6:1	2:10

Table 4: Chronological age and age equivalents in the 1st grade tests and the 4th grade test.

As Dahl & Vulchanova noted, in the course of the 8 months of testing in 1st grade, the NE exposure group had a vocabulary growth corresponding to that obtained in 3 months for their native speaker age equivalents. The EE group however, and surprisingly, showed a vocabulary increase larger than that corresponding to 8 months, namely 10 months. Looking at the results for the 4th grade tests, we see that in the 2 years and 11 months that have passed since the 1st grade post-test, the NE exposure group have had an increase in age equivalent of 3 years, while the age equivalent of the EE exposure group has increased by 2 years and 10 months. Although both age equivalent differences are very close to the actual age increase (one month more and less respectively), we see that it is the NE exposure group that has had the largest increase in age equivalent. However, the EE exposure group still has the mean raw score that corresponds to the highest age: at a chronological age of 9:8 (9 years and 8 months), the NE group has a vocabulary raw score that corresponds to that of a native speaker at age 5:7, while the EE group mean score corresponds to the vocabulary of a native speaker at age 6:1.

4.1.4. Standard scores

The PPVT-4 standard scores are deviation-type normative scores. This means that the scores indicate the examinee's development "compared with that of a well-defined reference group consisting of a large cross section of people of the same age or in the same grade" (Dunn & Dunn 2007:17). The standard scores hence suggest whether the examinees perform at, above, or below average for their age peers. As at an average vocabulary increase the same increase happens to the examinee's age peers, a standard score difference of 0 indicates development that is at average for that age group. Differences above and below 0 indicate development above and below average for that age, respectively. The standard scores can be found in Table B.1 in the PPVT-4 manual, by looking at both chronological age and raw score. Again, these scores are calculated from the average development of native speakers of

English. However, it is interesting to use the development figures for the large native speaker control group as a comparison for the results in this study. The standard scores are presented in Table 5 below.

Standard scores	1st grade pre-test	1st grade post-test	Difference, pre-post 1st	4th grade test	Difference post 1st-4th
NE	53	53	0	64	11
EE	54	62	8	70	8

Table 5: Standard scores. A standard score difference of 0 indicates a rate of vocabulary growth that is at average for that age group. A difference of more than 0 implies a growth rate that is above average for the age group, and conversely below average when the difference is less than 0.

We see that during the first 8 months of 1st grade, the NE exposure group retained the same standard score of 53. This indicates a hearing vocabulary growth that is at average for their age peers. For the EE exposure group however, the increase of 8 in the standard score during 1st grade suggests a vocabulary growth that is above that of their age peers. From the 1st grade post-test until the 4th grade test both groups show an increase in standard score. The increase is the largest for the NE group, which suggests that even though both groups show a hearing vocabulary growth above the average for their age peers, it is the NE exposure group that has had the most rapid increase of the two groups.

4.2. Other possible contributing factors to vocabulary growth

A four-way factional ANOVA analysis was conducted to investigate the effects of exposure to English language through media and traveling (Appendix 5). The dependent variable was the individual raw scores from the PPVT-4 test, and the four independent variables were: EE or NE exposure group; hours of English language exposure through media; type of media; visits to countries where English is an official language (Appendix 4). Levene's Test of Equality of Error Variances yielded a non-significant error variance, which implies that the analysis is appropriate for these data.

4.2.1. English exposure through media

Regarding English input through media exposure, we first wanted to see if there was any effect of the number of hours the child read or heard English through different media on their raw score on the PPVT-4 test. The ANOVA revealed no statistically significant effect, with $F(3, 14) = 1.503$, $p = 0.257$.

To investigate whether the type of media the children were exposed to had an impact on their English vocabulary development, the reported media types were divided into values of interactive and non-interactive media types. Testing for these two types of media against raw scores did not yield a statistically significant result, with $F(1, 14) = 0.454$, $p = 0.512$. We then wanted to analyze whether there was a correlation between the three independent variables of being in the NE versus the EE group, the amount of exposure in hours to English through media, and the type of media used, with the dependent variable of raw score performance in the PPVT-4 test. As for the two first results, the analysis yielded no statistically significant correlation, $F(1, 14) = 2.754$, $p = 0.119$.

4.2.2. English exposure through traveling

To investigate whether travels to foreign countries where English is an official language had an impact on the vocabulary scores of the children, this was one of the independent variables in the ANOVA. The analysis, with the dependent variable of PPVT-4 raw scores, revealed no significant results, with $F(1, 14) = 2.650$, $p = 0.126$. Analysis results for a correlation between being in the NE versus the EE group and stays in countries where English is an official language, with the dependent variable of raw scores, also revealed a statistically non-significant result, $F(1, 14) = 0.627$, $p = 0.442$.

5. Discussion

5.1. The PPVT-4 tests

5.1.1. Mean raw scores

The mean raw scores reveal an interesting change in the growth rate of the children in the EE exposure group and the NE exposure group compared. During the 8 months of Dahl & Vulchanova's study, the two groups displayed very different rates of development, in that the NE exposure group did not show a statistically significant change in raw score, while the EE exposure group's growth of vocabulary size measured in raw score was both significant and substantial, as showed in Table 1 and Figure 1 (Chapter 4.1.1.). Looking at these results in relation to the 4th grade test results we see, as mentioned, a much more parallel development between the two groups in the years succeeding the first tests: While the growth in mean raw score per year in 1st grade calculated on grounds of the 8 months of the study was 8.13 for the NE exposure group, and 28.07 for the EE exposure group, this mean growth per year from the 1st grade post-test to the 4th grade test was 21.43 for the NE exposure group and 19.30 for the EE exposure group. These results demonstrate a substantial change in the annual mean raw score growth for the two groups compared to that seen in 1st grade. Looking at the illustration of these results in Figure 2 (Chapter 4.1.1.), we see the now almost parallel development of the NE and the EE exposure groups, which was not present in the 1st grade tests. In Dahl & Vulchanova's tests the differing variable between the two groups was the extra English input, which seemed to yield the superior development in vocabulary size of the EE exposure group. Taking into account that this variable of systematic extra English input has been removed since the 1st grade tests, this development suggests that it is the loss of extra language input that impedes the further superior development of the EE exposure group: As the input amount becomes similar to that of the NE exposure group, so does the vocabulary growth.

The four-way factorial ANOVA analysis indicates that there is no statistically significant difference between the EE and the NE exposure groups, as $F(1, 14) = 0.114$, $p = 0.741$. This means that we can not conclude that the participants of the EE exposure group have maintained the advantage in vocabulary size that they gained in 1st grade, because it is possible that their higher mean raw score could correspond to chance. However, this result underlines the finding that the mean raw scores of the

two groups are becoming increasingly similar compared to the 1st grade tests, and supports the hypothesis that the removal of systematic extra English input results in slower development of vocabulary.

5.1.2. GSV scores

The GSV score system standards for determining statistical significance of vocabulary growth is a useful tool in this context. While in the 1st grade tests only the EE exposure group showed a difference in GSV scores with a statistical significance, both groups do so in the 4th grade test compared to the 1st grade post-test. The change in the GSV scores substantiates the development suggested by the growth in mean raw scores: that the substantial difference in the development of the two groups has decreased after the 1st grade tests. What the results also show, is a greater growth of GSV scores in the NE exposure group than in the EE group. This indicates that while in 1st grade the EE group had the more rapid increase in vocabulary growth, the NE group now develops faster than the EE group in this respect. Although not statistically significant in the factorial ANOVA, the EE group still retains a higher score of both mean raw score and GSV values, but the steeper curve of the NE group's vocabulary development suggests that this difference might be eliminated over time.

The GSV scores also show that both groups have had a significant and substantial vocabulary growth during the first four years of English instruction in school. Hence, despite the low amount of input through teaching hours per week and the results of the 1st grade tests, there are still factors in their environment which do contribute to language learning.

5.1.3. Age equivalents

From the age equivalents in Table 4 we see the mean ages of native speaker examinees that correspond to the respective PPVT-4 mean raw scores obtained by the non-native examinees in this study. In Dahl & Vulchanova's study with a duration of 8 months, the children in the NE exposure group had an increase in age equivalent of 3 months, while the EE exposure group's vocabulary development corresponded to that of 10 months in their age equivalents. As neither of the participants included in this study is bilingual, their age equivalents are lower than their chronological age (a development from age 2:4-2:7 for NE participants and 2:5-3:3 for EE participants in 1st grade, with a chronological age of 6:1-6:9). However, it is very interesting to observe that the children of the EE exposure group had an

increase of age equivalent during 1ˢᵗ grade which was greater than that of the native speakers with the same initial age equivalent, hence that they learned vocabulary at a faster rate than native speaker children at age 2:5. Dahl & Vulchanova point out that "it seems that young L2 acquirers need less substantial exposure than do L1 acquirers, at least at early stages; this can probably be explained by their already existing knowledge of concepts and L1 equivalents." The superior development even compared to young native speakers might hence be due to the fact that children acquiring a first language need to understand the concepts of the world at the same time as acquiring the vocabulary for these, while children who have already acquired a first language can pin new words or translations to their existing words and knowledge of the world. In addition, the age groups that the participants were in both during the 1ˢᵗ grade tests and the 4ᵗʰ grade tests seem to be included in a period of linguistic maturation in the first language. In a study of idiom comprehension in young native speakers of Bulgarian, Vulchanova *et al.* found that the age of 6-7 seems to be the starting point of the acquisition of idioms, and that at age 10 is a turning point in this respect, where the children's knowledge of idioms "starts approximating adult patterns" (2011:156). They further link this finding to metalinguistic awareness, which seems to emerge during the same period of life, involving that they "can reason about language and are aware of its symbolic and arbitrary nature, of intra-systemic relations, and can draw inferences exclusively on the basis of linguistic context" (Vulchanova *et al.* 2011:155). The maturation of the language users in this age group and the greater awareness of metalinguistic features of language is likely to have a positive effect on their ability to learn a second language.

For the 4ᵗʰ grade tests of the current study, the age equivalents underline the findings form the raw scores and the GSV values: we now see that the development of the two groups are much more similar to each other. From the 1ˢᵗ grade post-tests to the 4ᵗʰ grade tests, the age equivalents of the two groups are only separated by two months (3:0 for the NE group and 2:10 for the EE group). Furthermore, the changes in age equivalents are very similar to the change in chronological age, which is 2:11 for both groups. The rate of vocabulary development of the NE group has hence increased compared to that in 1ˢᵗ grade, while the rate of the EE exposure group seems to be a bit slower than what it was in 1ˢᵗ grade. Still, as shown with the mean raw scores and the GSV scores, the EE group still retains the highest age equivalent, of 6:1.

5.1.4. Standard scores

While the age equivalents show the children's development relative to that of younger native speakers with the same raw score, the standard scores show their development relative to native speaker age peers of their current chronological age. The results might be surprising at first: they show that the NE group in 1st grade had a development that was at average for their age peers. For the EE group in 1st grade, and for both groups between the 1st grade post-test and the 4th grade test, the development is above that of native speakers with the same chronological age. However, it must be kept in mind that compared to their native speaker age peers, the children in this study obtained a low mean raw score. As evidenced by their age equivalents, their raw scores in 4th grade correspond to those of native speakers who are approximately four years younger than they are. Hence, what the raw scores indicate is that the participants have had a raw score development that is above average for their age peers with low raw scores.

Looking at both age equivalents and standard scores, we see that both groups between the 1st grade post-test and the 4th grade test have had a vocabulary size development at about the same rate as their younger age equivalents, while they seem to have developed faster than their age peers with low scores. The explanation for this might be connected to aspects of first language acquisition development. Several studies over the last decades have suggested a "vocabulary spurt" in young children acquiring their first language (Goldfield & Reznick 1990; Mervis & Bertrand 1995). The theory suggests that young children experience a sudden peak in their vocabulary acquisition, acquiring words at a much faster rate than they do earlier and later. This hence suggests that the average vocabulary size development of native speakers with the same chronological age as the participants in the current study is slower than that of their younger age equivalents. Such a spurt could explain why the participants, who are yet early in the acquisition process and still have much vocabulary to learn and seem to develop at approximately the same rate as their age equivalents, seem to have a faster growth of vocabulary size than do their native speaker age peers.

These four methods of reporting the vocabulary size development of the participants – mean raw scores, GSV scores, age equivalents and standard scores – provide different contributions to the discussion of the results, but they also provide common support to some issues. First of all, they show

that a growth in vocabulary size has indeed taken place between the 1st grade post-test and the 4th grade test, conversely to what the NE group's developmental pattern in 1st grade would suggest, failing to display a statistically significant growth of vocabulary size. Secondly, the results indicate that while the rates of vocabulary growth in the two groups in 1st grade were very different, they seem to be almost parallel from the 1st grade post-test to the 4th grade test. The higher mean raw score of the EE group also suggests that they have retained a small advantage in vocabulary size and age equivalent. However, this difference is not large enough to be statistically significant, as shown by the factorial ANOVA analysis.

5.2. Other possible contributing factors to vocabulary growth

Several children with knowledge to words in the PPVT-4 set that were not commonly recognized in the testing (such as the words "archery", "construction" and "escorting") reported to have learned them in computer games and through TV and films. From these reports it is clear that these sources of input can indeed be beneficial for vocabulary learning. Some parents also specifically reported these sources of English language input as a source of language learning for their child. However, there is no overall systematic and statistically significant result in this study showing a positive correlation between type or amount of hours of exposure to English language media sources and raw score on the PPVT-4. Though it could be seen that the NE group participant with the highest raw score also had the highest amount of hours of English input through media (10 hours per week), this was not the case for the EE group, in which the participant with the highest raw score was only reported to have English language exposure through media for 1-2 hours per week. The same lack of systematic trend could be seen throughout the list of examinees (Appendix 4), and is confirmed by the lack of significance in the ANOVA analysis.

The absence of statistical significance is also true for the reported travels to countries where English is the official language. Although some parents did report that their child had improved their English skills when traveling, this could not be proved as a whole for the children through the statistical analyses.

Neither the reported English exposure through media nor that of traveling to countries where English is an official language hence yielded statistically significant results in the factorial ANOVA. The results

from this study hence suggest that the stays in countries where they are likely to be exposed to English, and the amount and type of English language input the children receive through media have not had a significant impact on their vocabulary size. Additionally, we see that the amount of such input is very variable between subjects – some children only hear or see English for half an hour per week, while others do so for ten hours per week. As a result of this individual variability and the lack of significant result, it seems important that input must be a focus in the formal English instruction in schools. The lack of statistically significant impact of input from these sources also strengthens the hypothesis that it is the EE input in the teaching environment that was the source of the rapid vocabulary increase for the EE group in 1st grade, and that it is the absence of this that has lead to the parallelization of the development through 4th grade.

The lack of statistically significant correlation between the media exposure and the variable of whether the participants are in the EE or the NE exposure group could be a partial explanation for the lack of statistical difference between the mean raw scores of the two groups. If the participants in the two groups have received approximately the same amount and type of input through media overall, this could be a contributing factor to similarities in the rate of vocabulary growth. This potential correlation is an issue that needs to be tested further.

5.2.1. Limitations to the questionnaires

The questionnaires filled out by the parents provide an indication of the English input their children are exposed to through media. However, some limitations are found to this way of gathering information. First of all, it can be difficult for the parents to correctly estimate the amount of hours their child sees or hears English per week. In everyday life they may not pay particular attention to the language aspect of their child's media usage, and it is not certain that they are always present or aware when their child watches TV or plays computer games. Also, both parents might not provide the same boundaries for their child's media usage, especially in families where the parents no longer live together. For some of the children in this study two questionnaires were returned – one filled out by the mother and one by the father. The fact that these questionnaires did not report the same amount of media usage hours per week for the same child, suggests that the reported amount of hours may not always be correct. In addition, the fact that some questionnaires were handed in with only a specification of either the number of hours or the media type even though both were requested in the instructions, suggests

varying efforts into the filling out of the form. However, for the scope of this study it is not possible to observe the children, so reports from the children's caretakers is the best way to obtain the desired information.

The reporting of the travels to foreign countries is simpler in that they happen less frequently and that the parents are always both participants and initiators of the activity, and so the information is likely to be correct. However, even though we know which countries have been visited and the duration of the stay, we do not know to which degree the child has heard or spoken English. This will highly depend on the activities the families engage in, to what extent they interact with native speakers, and whether the child itself is encouraged to practice communication in English. We can therefore not conclude that input through traveling does not affect the vocabulary size in general, but for these children it seems not to have done so to a statistically significant degree.

6. Conclusion

The aim of this study was to investigate the effects of discontinued systematic extra English (EE) input in a Norwegian 4th grade group compared to a group of age peers who had not received such extra English input (normal English – NE). 44 monolingual Norwegian children with a mean age of 9:8 in two socioeconomically similar schools were tested using the Peabody Picture Vocabulary Test (PPVT-4) (Dunn & Dunn 2007). The hypothesis was that the discontinuation of extra input after the two first years of English instruction would cause the previously seen superior vocabulary size growth of the EE exposure group to become similar to the growth rate of the NE group. It was also hypothesized that the advantage seen in vocabulary size during the first year of English instruction would remain compared to the vocabulary size of the NE exposure group.

The background of the current study is a study conducted by Anne Dahl and Mila Vulchanova (submitted), in which 60 children in two schools were tested for vocabulary size at the beginning and towards the end of their first year of formal English instruction in school. One of the schools agreed to systematically provide extra English input, both as language of instruction in English classes, for some simple classroom management with Norwegian translations in and between other classes, and for morning meetings every day. The group in the other school continued teaching English as they normally do, with no extra focus on providing English input. The results of the study showed that while the NE exposure group had no significant growth of vocabulary size during the first year, the EE exposure group demonstrated a significant and substantial growth. These results suggested an advantage in vocabulary acquisition with the provision of extra English input within the scope of the existing required teaching hours.

The current study conducted towards the end of the fourth year of the children's English instruction in school, two years after the systematic EE input focus was discontinued, showed a different development of vocabulary size than that seen in Dahl & Vulchanova's study. The vocabulary size of the two groups, measured by mean raw score in the PPVT-4, increased at a much more similar, almost parallel rate between the 1st grade post-test and the 4th grade test. The Growth Scale Value (GSV) scores confirm that the growth of both groups is statistically significant, indicating that despite few teaching hours and the statistically insignificant growth of the NE exposure group in 1st grade, the children's

vocabulary sizes in both groups have significantly increased by the end of 4th grade. The comparisons to age equivalents and standard scores provide interesting insight into the participants' vocabulary size development in relation to that of English native speakers. The age equivalents indicate that the participants' mean raw scores and vocabulary size development are equivalent and even in some cases slightly superior to those of young native speaker children. Explanations for the result of faster development (for the EE exposure group in the 1st grade tests and for the NE group in the 4th grade test) might be the L2 learners' access to existing vocabulary and concepts in their native language, and the greater metalinguistic knowledge that seems to develop in their age group. The standard scores indicate that the participants learn new words at a faster rate than average for their age peers (with low scores). Together with the results from the age equivalents, an explanation of this might be the presence of a "vocabulary spurt" in young children, which assumes a faster vocabulary growth in younger than in older children.

The study also hypothesized that English input through media, especially interactive media such as computer games, and through travels in countries where English is an official language, could have an impact on the children's vocabulary size. Parents were therefore requested through a questionnaire to report on hours and types of English language media usage, and on travels to foreign countries. However, a four-way factorial ANOVA analysis showed no statistically significant impact on any of these factors on the raw scores. This suggests that the results found in vocabulary size development are not significantly affected by these external factors.

The mean raw score in 4th grade was higher for the EE exposure group (102.00) than for the NE exposure group (93.42). However, the factorial ANOVA shows that this difference is not statistically significant. Therefore, we can not conclude that the initial boost of vocabulary that the EE exposure group showed in the 1st grade post-test has had a lasting advantageous effect on vocabulary size compared to the NE group.

6.1. Questions for further research

The results of this study raise a number of questions that could be the subject for further research. First of all, what would be the effect of continued systematic extra English exposure? Dahl & Vulchanova's study showed a substantial difference in the development of the two groups when adding the EE

exposure variable. If this variable would be present for a longer period of time than two years, would the vocabulary size of the EE exposure group continue its superior growth compared to the NE exposure group?

Looking at the graph showing the development of the mean raw scores (Figure 2, Chapter 4.1.1.), we see the almost parallel increase in vocabulary size for the two groups. However, the increase also seems to be slightly larger for the NE exposure group, so that the mean raw score results of this group is gradually approaching those of the EE exposure group. Further studies could contribute to investigate whether this development would prove statistically significant during a greater time scope. Would the NE exposure group ultimately catch up with, or even outperform the EE exposure group, so that the initial advantage of the latter would be completely eliminated?

Furthermore, it would be interesting to test for other aspects of the second language acquisition than the vocabulary. Could other linguistic features such as the acquisition of grammatical aspects of English contribute to the strengthening or weakening of the current results based on vocabulary size? Such studies would contribute to further insight into the role of input in second language acquisition.

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Appendices

Appendix 1: Parental consent form for the NE school

Forespørsel om deltakelse i forskningsprosjekt

Hei alle foreldre ved fjerde trinn på [NE] skole!

Mitt navn er Tonje, og jeg er mastergradsstudent i engelsk ved NTNU. I forbindelse med min mastergradsoppgave vil jeg undersøke hvilken effekt økt eksponering for engelsk i skolen har på elevenes læringsutbytte gjennom deres første år på skolen. For å prøve å finne ut av dette, vil jeg teste norske fjerdeklassingers engelsk-vokabular.

I denne sammenheng vil jeg be om tillatelse til å teste deres barn én gang i løpet av våren/høsten. Med "test" menes ikke "prøve" i skoleforstand, men derimot en forskningsmessig test. Jeg bruker velutprøvde testmetoder som ungene syns er artige og ikke oppfatter som skremmende. Responsen fra elever som har tatt testen tidligere har vært positiv, og mange har sagt at de syntes det var morsomt å delta.

Under testene fokuserer vi ikke på riktige og gale svar overfor ungene, og testene er designet for å gi ungene en mestringsfølelse uavhengig av teknisk score. Under testene er bare det enkelte barnet og én eller noen ganger flere prosjektmedarbeidere til stede. Prosjektmedarbeiderne er meg selv, min veileder professor Mila Vulchanova, og doktorgradsstudent Anne Dahl. Det er viktig for den forskningsmessige kvaliteten at ungene føler seg trygge i testsituasjonen, og vi vil derfor sørge for at de kjenner minst en av de voksne til stede før testingen. Hver test vil ta omtrent en halv time, og foregå i skoletiden.

Jeg er altså ute etter statistiske data, ikke etter å se hvor "flinke" de enkelte barna er. Resultatene av testingen vil bare håndteres av meg og mine medarbeidere, og vil være fullstendig anonymiserte før de brukes i offentligheten. I første omgang lagres alle resultatene med en personkode som tilsvarer hver elev på en atskilt navneliste slik at navn på eleven og resultater på testene ikke oppbevares på samme sted. Ved prosjektets slutt i mars 2014 vil dataene anonymiseres fullstendig ved at elevenes navn og andre personopplysninger slettes helt. Deltakelse i prosjektet er selvsagt frivillig, og hvis dere ikke svarer på denne forespørselen, vil deres barn ikke bli involvert i studien. Hvis dere har spørsmål eller ønsker mer informasjon om prosjektet, må dere svært gjerne kontakte meg. Godtar dere at barnet deres deltar i prosjektet, kan dere selvsagt likevel ombestemme dere og reservere dere når som helst. Dere behøver i så fall ikke gi noen begrunnelse for hvorfor dere ønsker å trekke dere.

Hvis dere velger alternativet "ja" under, vil dere i løpet av kort tid få et enkelt spørreskjema der jeg ber om litt mer informasjon om barnets bakgrunn som kan være relevant for språklæringen. Denne informasjonen vil behandles konfidensielt på lik linje med all annen personlig informasjon som kommer fram gjennom prosjektet. Skulle dere se at dere ikke ønsker å fylle ut dette skjemaet, kan dere la være å returnere det, og dere vil da regnes som å ha trukket dere fra prosjektet uten at dere trenger å foreta dere noe mer.

Med aller beste hilsen,

Tonje Gauslaa Sivertzen

Mastergradsstudent
NTNU, Institutt for moderne fremmedspråk
Tlf. 91157106, epost tonje.gs@gmail.com

_____

☐   Ja, jeg godtar at mitt barn deltar i forskningsprosjektet

_____   _____   _____

Barnets navn   Sted og dato   Foresattes underskrift

Appendix 2: Parental consent form for the EE school

Forespørsel om deltakelse i forskningsprosjekt

Hei alle foreldre i fjerde klasse på [EE] skole!

Som dere kanskje vet, hører barna deres litt mer engelsk på skolen enn det som er vanlig for norske elever, fordi lærerne bruker mer engelsk utenom engelsktimene. Dette har de gjort i mange år, med gode erfaringer.

I forbindelse med denne «ekstra engelsken» deltok mange av elevene som nå går på fjerde trinn, i en undersøkelse da de gikk i første klasse. Den gang var det en doktorgradsstudent som var interessert i å finne ut hvilken effekt økt eksponering for engelsk i skolen hadde på elevenes læringsutbytte gjennom deres første år på skolen.

Jeg er mastergradsstudent ved NTNU, og er interessert i å studere dette videre, for å se på hvordan tendensen fra starten til slutten av første klasse kan sammenliknes med elevenes engelske vokabular nå når de har nådd fjerde klasse. I denne sammenheng vil jeg be om tillatelse til å teste deres barn én gang i løpet av våren. Selve testen vil være den samme som Anne Dahl brukte i sitt doktorgradsprosjekt for tre år siden, men min testing vil altså være av mindre omfang.

Med "test" menes ikke "prøve" i skoleforstand, men derimot en forskningsmessig test. Jeg bruker velutprøvde testmetoder som ungene syns er artige og ikke oppfatter som skremmende. Responsen fra elevene da de tok testen forrige gang var svært positiv, og mange sa at de syntes det var morsomt å delta.

Under testene fokuserer vi ikke på riktige og gale svar overfor ungene, og testene er designet for å gi ungene en mestringsfølelse uavhengig av teknisk score. Under testene er bare det enkelte barnet og én eller noen ganger flere prosjektmedarbeidere til stede. Prosjektmedarbeiderne er meg selv, min veileder professor Mila Vulchanova, og doktorgradsstudent Anne Dahl. Det er viktig for den forskningsmessige kvaliteten at ungene føler seg trygge i testsituasjonen, og vi vil derfor sørge for at de kjenner minst en av de voksne til stede før testingen. Hver test vil ta omtrent en halv time, og foregå i skoletiden.

Jeg er altså ute etter statistiske data, ikke etter å se hvor "flinke" de enkelte barna er. Resultatene av testingen vil bare håndteres av meg og mine medarbeidere, og vil være fullstendig anonymiserte før de brukes i offentligheten. I første omgang lagres alle resultatene med en personkode som tilsvarer hver elev på en atskilt navneliste slik at navn på eleven og resultater på testene ikke oppbevares på samme sted. Ved prosjektets slutt i desember 2013 vil dataene anonymiseres fullstendig ved at elevenes navn og andre personopplysninger slettes helt. Deltakelse i prosjektet er selvsagt frivillig, og hvis dere ikke svarer på denne forespørselen, vil deres barn ikke bli involvert i studien. Hvis dere har spørsmål eller ønsker mer informasjon om prosjektet, må dere svært gjerne kontakte meg. Godtar dere at barnet deres deltar i prosjektet, kan dere selvsagt likevel ombestemme dere og reservere dere når som helst. Dere behøver i så fall ikke gi noen begrunnelse for hvorfor dere ønsker å trekke dere.

Hvis dere velger alternativet "ja" under, vil dere i løpet av kort tid få et enkelt spørreskjema der jeg ber om litt mer informasjon om barnets bakgrunn som kan være relevant for språklæringen. Denne informasjonen vil behandles konfidensielt på lik linje med all annen personlig informasjon som kommer fram gjennom prosjektet. Skulle dere se at dere ikke ønsker å fylle ut dette skjemaet, kan dere la være å returnere det, og dere vil da regnes som å ha trukket dere fra prosjektet uten at dere trenger å foreta dere noe mer.

Med aller beste hilsen,

Tonje Gauslaa Sivertzen

Mastergradsstudent
NTNU, Institutt for moderne fremmedspråk
Tlf. 91157106, epost tonje.gs@gmail.com

_____

☐   Ja, jeg godtar at mitt barn deltar i forskningsprosjektet

_____   _____   _____

Barnets navn   **Sted og dato**   **Foresattes underskrift**

Appendix 3: Background questionnaire

Bakgrunnsinformasjon for forskningsprosjekt om engelsk

Jeg er svært takknemlig for at dere har sagt ja til å la barnet deres være med i mitt forskningsprosjekt om språkkunnskaper i engelsk for fjerdeklassinger, dette er svært verdifullt for prosjektet!

I dette skjemaet ber jeg dere vennligst svare på noen korte spørsmål som vil gi meg bakgrunnsinformasjon jeg trenger for å kunne bruke testresultatene. Dersom dere er usikre på hvilke av svarene dere skal krysse av på, eller føler at dere trenger å gi utdypende informasjon, bruk gjerne tekstboksene eller et eget ark til dette!

Barnets navn: _____

Barnets fødselsdato: _____

1. Barnets språklige bakgrunn utenfor skolen

☐ Barnet har fra før ingen spesielle kunnskaper i andre språk enn norsk.

☐ Barnet snakker ____angi språk_____ bedre enn han/hun snakker norsk.

☐ Barnet snakker ____ angi språk _____ omtrent like godt som han/hun snakker norsk.

☐ Barnet snakker ____ angi språk _____, men han/hun snakker norsk bedre.

2. Barnets tilgang til engelsk utenfor skoletiden

Omtrent hvor mange timer hører eller leser barnet engelsk utenfor skoletiden i gjennomsnitt per uke? Dette kan for eksempel være gjennom engelskspråklig tv, film, bøker, tegneserier, musikk, dataspill eller annen pc-bruk etc. Angi hvilke aktiviteter det eventuelt er snakk om:

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3. Barnets tidligere møter med engelsk og andre fremmedspråk

I skjemaet øverst på neste side, vennligst fyll inn hvilke land barnet har vært i utenom Norge i løpet av sitt liv, inkludert både korte og lengre opphold, omtrent hvor lenge barnet var der, og barnets alder da han/hun var der. Hvis barnet ikke er født i Norge føres dette også opp, sammen med alder for når han/hun flyttet til Norge.

Land barnet har besøkt:	Oppholdets varighet	Barnets alder ved oppholdet

4. Barnets søsken (med søsken menes her andre barn som bor sammen med barnet i alle fall deler av tiden)

Antall brødre: ☐   Brødres alder: ☐   Antall søstre: ☐   Søstres alder: ☐

Dersom barnet har søsken han/hun ikke bor sammen med hele tiden, kan tid de bor sammen spesifiseres her:

5. Andre forhold som kan påvirke språklæringen

Har barnet, eller har det hatt, hørselsproblemer, alvorlige synsproblemer eller andre diagnoser som
kan tenkes å påvirke språklæring (f.eks. spesifikke språkvansker, dysleksi, ADHD, autisme, osv.)?

Ja ☐   Nei ☐

Hvis ja, vennligst spesifiser i her:

Kryss av her hvis barnet har en tilstand eller diagnose dere ikke
ønsker å beskrive på skjemaet, men som dere kan tenke dere å fortelle meg om personlig: ☐

6. Andre opplysinger

Er det andre opplysninger eller mer utfyllende informasjon som gjelder barnet ditt som du tror jeg kan ha nytte av å vite om i prosjektet mitt? Dette kan være utfyllende informasjon om barnets språkkunnskaper utover norsk, om barnets møter med engelsk, eller andre ting du tror kan påvirke resultatene av testene. Bruk gjerne eget ark om nødvendig.

-Tusen takk for hjelpen!

Appendix 4: SPSS – Variables and values used in the ANOVA

Participant code	EE_NE	Raw_score	Hours_of _English	Media_ exposure	English_language _countries
TN2	1	127	1	-	2
FO9	1	126	2	1	2
KJ9	1	120	1	-	2
OZ9	1	120	3	1	2
VU1	1	117	1	1	2
XQ9	1	115	1	2	2
EX7	1	113	1	2	1
SM0	1	113	1	-	2
FH2	1	108	2	2	1
QJ5	1	107	2	1	2
KC2	1	106	-	1	1
LQ7	1	104	2	1	1
KA0	1	104	2	1	1
WF7	1	103	3	1	2
XP8	1	103	2	1	2
DF8	1	99	2	-	2
YI1	1	96	1	1	2
DX6	1	95	3	-	2
KK0	1	91	2	-	2
KI8	1	90	1	2	2
II6	1	86	1	1	1
PC7	1	86	1	1	2
GJ5	1	84	2	2	2
AW2	1	70	3	-	2
ID1	1	67	1	1	2
CU2	2	125	3	1	1
CJ1	2	124	2	2	2
IE2	2	117	2	1	1
TR6	2	110	2	1	2
MD5	2	109	2	1	2
HC9	2	107	3	2	2
QR3	2	101	-	2	1
YH1	2	98	1	2	1
CW4	2	95	1	1	2
FD8	2	93	2	2	2
WG8	2	93	1	2	2
LO5	2	88	-	1	1
TL0	2	85	2	1	2
LY5	2	83	-	1	2
ZU5	2	79	2	1	2
OL5	2	73	2	1	2
YU4	2	71	2	1	2
JH6	2	65	-	2	2
FW7	2	59	1	-	-

Values: **EE_NE:** *1=Extra English input, 2=Normal English input.*

Hours_of_English: *1= 0-3 English media hours per week, 2= 4-7 hours per week, 3= 8-10 hours per week.*

Media_exposure: *1= Interactive media, 2= Non-interactive media*

English language countries: *1= Stay beyond 7 days in a country where English is an official language.*

2= Stays in countries with other official languages, or shorter stay than 7 days in English speaking country.

Names were replaced by participant codes to assure anonymity.

Appendix 5: The ANOVA – Between-Subjects Effects

Tests of Between-Subjects Effects

Dependent Variable: Raw score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[b]
Corrected Model	5416,972[a]	21	257,951	,887	,608	,571	18,636	,333
Intercept	213465,234	1	213465,234	734,399	,000	,981	734,399	1,000
EE_NE	33,015	1	33,015	,114	,741	,008	,114	,061
Hours_of_English	1310,281	3	436,760	1,503	,257	,244	4,508	,312
Media_exposure	131,858	1	131,858	,454	,512	,031	,454	,096
English_language_countries	770,331	1	770,331	2,650	,126	,159	2,650	,329
EE_NE * Hours_of_English	423,748	2	211,874	,729	,500	,094	1,458	,149
EE_NE * Media_exposure	267,813	1	267,813	,921	,353	,062	,921	,146
EE_NE * English_language_countries	182,323	1	182,323	,627	,442	,043	,627	,115
Hours_of_English * Media_exposure	306,084	2	153,042	,527	,602	,070	1,053	,120
Hours_of_English * English_language_countries	260,732	2	130,366	,449	,647	,060	,897	,109
Media_exposure * English_language_countries	628,656	1	628,656	2,163	,164	,134	2,163	,278
EE_NE * Hours_of_English * Media_exposure	800,585	1	800,585	2,754	,119	,164	2,754	,340
EE_NE * Hours_of_English * English_language_countries	,000	0	.	.	.	,000	,000	.
EE_NE * Media_exposure * English_language_countries	,000	0	.	.	.	,000	,000	.
Hours_of_English * Media_exposure * English_language_countries	45,851	1	45,851	,158	,697	,011	,158	,066
EE_NE * Hours_of_English * Media_exposure * English_language_countries	,000	0	.	.	.	,000	,000	.
Error	4069,333	14	290,667					
Total	359753,000	36						
Corrected Total	9486,306	35						

a. R Squared = ,571 (Adjusted R Squared = -,072)

b. Computed using alpha = ,05