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Role of subtitles in L2 acquisition and comprehension

Evidence from hearing-impaired students

Master's thesis in English Language

Supervisor: Mila Vulchanova

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Kunnskap for en bedre verden

Abstract

The aim of this study is to review the benefits that subtitles provide in the ESL classroom for learners with a mild-to-moderate hearing loss. Specifically, the study investigates if the use of subtitles in second language learning is beneficial for learners of English with a minimal-to-moderate hearing impairment, to what extent subtitles are beneficial, and also in what language the subtitles should be presented in. The study is based on a quantitative experimental research method. The participants varied from the age of 18-25 and were categorised as having a hearing loss from 25-70 dB. The experiment was carried out as an online survey and contained three different 5-6 minute clips from the documentary *Expedition Happiness*. The first clip they watched had Norwegian (L1 subtitles), the second had English (L2 subtitles), and the last clip had no subtitles. From comprehension and vocabulary tasks following the viewing sessions I was able to conclude that subtitles are beneficial for both initial comprehension and vocabulary performance according to the amount of right versus wrong answers on the tasks. The analysis also revealed that level of hearing loss was a significant factor, and that students with moderate hearing loss benefitted from subtitles slightly more than the minimal hearing loss group. However, subtitles proved to aid general comprehension, and the participants also revealed that being provided with subtitles lessened their concentration load and made the viewing experience more comfortable.

There are few studies on the field of minimal-to-moderate hearing loss and language learning, and some of the studies only report the consequence of having a hearing loss, such as fatigue, degraded language input, low academic performance etc. My goal in this study is to illustrate what efforts can be made by educators of students with hearing loss that actually aid their second language learning experience.

Preface

At the age of 10 years old I was told that my hearing was so bad that I would never be able to successfully acquire a second language. Now, being a 25 year old English student and a soon-to-be English teacher, I am curious about what is crucial for successful language learning while suffering from hearing loss. This project the final project of my studies at NTNU before I move on to my future occupation as a language teacher. Therefore, this paper will not only discuss findings from the study I carry out, I will also discuss the difficulties that young hard of hearing individuals experience in the classroom for a deeper insight in the condition. It is important that educators understand how hearing loss can impact a pupil's well-being, and this study also contributes to findings that show *how* educators can take action in order to facilitate an including and beneficial hearing environment for their hard of hearing pupils. It is of my opinion that the results in this study can be transferred to several classrooms.

This study would not be possible without the help from my supervisor, Mila Vulchanova. I am so grateful that she found this topic just as interesting as I do. Thank you for the supporting comments when it all felt too demanding. Her enthusiasm in research is truly inspiring! I would also like to thank my fellow master students, Eirin Aarmo and Helle Nystad in particular, thank you for our valuable conversations over several coffee breaks throughout this semester. Regardless of the special times with covid-19 and being forced to work from home, we still continued with our virtual coffee breaks together, which I have appreciated a lot. An extra warm thanks to Emilie Bjellvåg who has been there through thick and thin during these five years at NTNU. Lastly, I would thank my parents, Ivar and Solbjørg, who have met my sporadic frustration during this time with love and support, and also for trying to learn how to use SPSS together with me. It is fair to say that we all have learned something new while working in this project. Last but not least, I am incredibly grateful for the participants who partook in this study. Not only for participating, but also for being open about being young whilst suffering from hearing impairment. For several years I have personally felt the stigma of hearing loss, but I do believe that when we are open about our disabilities and the difficulties they may carry, we take a step in the right direction. I have learned a lot from you.

Ingvild Kjølstad Lervåg

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Contents

1.0 Introduction	7
2.0 Hearing impairment	11
2.1 <i>Minimal hearing impairment – unilateral hearing loss</i>	12
2.1.1 Minimal-to-moderate hearing impairment: classroom strategies and consequences.....	13
2.1.2 Language development in mild-to-moderate hearing loss	14
2.1.3 Fatigue, psycho-social development, and perception	15
3.0 Second language acquisition.....	18
3.1 <i>Theories and approaches to second language learning- brief overview</i>	19
4.0 The role of input in second language acquisition.....	21
5.0 Films in education	22
5.1 <i>Audiovisual material as input</i>	23
5.1.1 Dual Coding Theory	24
5.1.2 A cognitive theory of multimedia learning – “multimedia principle”	24
5.2 <i>Studies on bi-modal input and language learning/comprehension</i>	26
6.0 Subtitles for hearing impaired viewers.....	28
7.0 Method.....	30
7.1 <i>Participants</i>	32
7.2 <i>Materials</i>	33
7.3 <i>Background questionnaire</i>	34
7.4 <i>Comprehension task</i>	34
7.5 <i>Word definition and vocabulary task</i>	35
7.6 <i>Procedure</i>	35
7.7 <i>Validity and reliability</i>	36
8.0 Analysis	37
8.1 <i>Results from Shapiro-Wilk test</i>	37
8.2 <i>Results from Wilcoxon test</i>	38
9.0 Discussion	40
9.1 <i>The comprehension questionnaire</i>	40
9.2 <i>The vocabulary and word definition task</i>	42
9.3 <i>Comments from participants</i>	44
10.0 Conclusion.....	48
Sources	51

Appendices	60
<i>Appendix 1. Consent form</i>	60
<i>Appendix 2. Background information</i>	60
<i>Appendix 3. Questions</i>	61
<i>Appendix 4. Table 1. Shapiro-Wilk test</i>	64
<i>Appendix 5. Table 2. Wilcoxon test</i>	65

1.0 Introduction

Working with students who suffer from an hearing impairment might raise questions about how to best facilitate a language learning environment that will be beneficial for their condition. The goal of this study is to get a deeper understanding on how visual cues, such as subtitles, can aid hard of hearing learners of English in the classroom. This paper is directed towards language teachers in particular, and the research area is second language learning for students with a mild-to-moderate hearing loss. The paper therefore contains an insight in the minimal-to-moderate hearing loss condition, consequences of suffering from hearing loss, reports on social and academic differences between normal and hard of hearing students, and finally, actions that are beneficial for hearing impaired students' second language learning. The actions discussed are primarily based on findings from this study.

Unless we talk about sign language, one have to be able to hear language in order to learn it. It is important to note that hearing impaired learners, even if they use hearing aids, have little access to aural cues, and will in most instances rely on visual cues such as lip movement, namely lip reading, and subtitles in order to comprehend what is being said (Pérez-Gonzales, 2018). It is therefore important for educators to facilitate a learning environment for these students so that they are able to develop their language further without having to depend on techniques that will not give them the ultimate learning experience. An including learning environment is a part of Norwegian schools' education policy (Opplæringsloven, 1998, §1-2). This means that Norwegian schools are obligated to make adaptations according to each individual's abilities. Therefore, students who suffer from hearing loss should not have to rely on for example lip reading (which is a common technique amongst hard of hearing people in order to perceive what is being said) and such in order to be able to comprehend what is being discussed in class. It is the teacher's job to know about the student's issue and they should have the competence on how they can facilitate an including learning environment for learners who suffers from a condition that makes learning hard for them. Nevertheless, Norwegian students with any degree of hearing loss are reported to participate less in classroom communication because of their hearing impairment (Ueland, 2018). Kermit (2018) states in his rapport on Norwegian students' educational rights that the main reason that hard of hearing students participate less is because of the teachers' lack of knowledge and outdated competence (p.5). Kermit (2018) claims that the publications on the field has an unusual high degree of unanimity: "Together they substantiate that Nordic kindergartens and schools have not succeeded in establishing inclusive practices where hearing impaired children and

adolescents are together with typical hearing peers. The hearing impaired children and adolescents pay the price for this failure” (2018, p. 11). It is also found that hearing impaired students achieve poorer results in school compared to their normal hearing peers, and also they display more psychosocial problems such as the feeling of loneliness and not fitting in (Kermit, 2018). It is argued that the main reason for poor inclusion regarding hearing impaired students is mainly due to lack of knowledge on the field, from both students and teachers (Kermit, 2018), also: if the students’ abilities to perceive communication is poor, their classroom participation and social participation will be negatively affected (Antia et al. 2011).

A lot is known about deafness as a condition and sign language learning (Reagan, 1995; Swanwick and Tsverik, 2007), and when reviewing the literature on the field of hearing impairment one can easily see that the majority of the studies conducted are on people who suffer from serious cases of hearing loss. However, it is found that any degree of hearing loss (also the less severe cases) can interrupt normal development of communication, social-emotional well-being, and academic performance (National Workshop on Mild & Unilateral Hearing Loss, 2005). Most (2004) reported that participants with mild to moderate hearing loss exhibited lower performance than those with more severe hearing loss, and that this is likely due to lack of classroom supports for the less hard of hearing students. Because deafness has been an area of interest for a long time, deaf people have to some extent benefitted from this in classroom settings as it exists valid sources saying what works and not in terms of their language development. However, the group of minimal hearing impaired students have still not gained the same interest in terms of research on educational development. On the field of minimal-to-moderate hearing impairment there are few studies on how to facilitate an including classroom environment, or how to make second language learning easier for them. Furthermore, it has been assumed that minimally hearing impaired children require few or no special assistance in the academic setting (Tharpe and Bess, 1991), which I in this paper will argue against.

Additionally, it is important to note that one reason for researching minimal-to-moderate hearing loss is due to the changes in the audiological profile of the hearing-impaired child, where these changes show that the number of children with severe hearing loss seems to be declining, while the number of children with a minimal hearing loss is increasing (Tharpe and Bess, 1991, p.41). Therefore, it is important to gain knowledge about the condition as it will benefit a greater group of people as it is too few studies on this field.

My chosen topic of interest and as a subject of this study is audiovisual material, namely film/documentary. The use of films in the classroom is not a new phenomenon, and audiovisual material in general is a frequently used resource in the English as a Second Language (hereafter named ESL) classroom (Vulchanova et al., 2015, p. 1). Using audiovisual material is beneficial for several reasons, however, when the film clips are shown with subtitles the viewing experience have the potential to be extra beneficial for hearing impaired students. This is because hard of hearing individuals rely more on visual cues in auditory language processing (Cavender et al., 2009). The visual cues are often limited to hand gestures, namely sign language, for students who suffers from deafness and severe hearing loss, and also lip reading (Trezek et al., 2007). The current study seeks to expand upon these techniques and explore the results of utilizing subtitled film clips to supplement education within second language learning (hereafter named SLA) for students who suffer from milder cases of hearing loss. When turning on subtitles the educator is given a choice in deciding which language the subtitles should be shown in, and therefore this paper will also discuss what language is the best option for the students to be exposed to regarding second language learning.

To explore this issue, 14 participants with minimal to moderate hearing impairment participated in an online survey that I designed. The survey consisted of three conditions: film clips with Norwegian (L1) subtitles, English (L2 subtitles), and no subtitles. After each scenario they were asked questions regarding comprehension and vocabulary relevant to what they had seen. I collected accuracy measures on both comprehension and newly activated words in all three conditions. The reason why I made two types of questions, on comprehension on vocabulary, was because I was interested in seeing what they benefitted most from, namely what they got out of watching the film clips in terms of language learning.

This study was inspired by the study “As Naturalistic as it gets: Subtitles in the English classroom in Norway” (Vulchanova et al., 2015). I was curious to see if I would find similar effects with students with a hearing impairment. The same method was used in my study, only with a few adjustments so that it would suit my study and my participants.

My research question is therefore: are subtitles a beneficial tool in SLA for hearing impaired learners of English? In this study I hypothesize that subtitles would enhance participants’ performance both on the comprehension task and on the vocabulary task, and that the

participants will feel that subtitles are beneficial for them. Also, I hypothesize that L2 subtitles are more beneficial than L1 subtitles because they have to answer in English when doing the tasks as the English L2 vocabulary is already activated by reading the subtitles.

2.0 Hearing impairment

As I mentioned in the introduction, the large number of people affected with minimal hearing impairment makes the disorder highly relevant to any educator as the group is increasing. In Norway there are about 700 000 people suffering from hearing loss, and about 0,25 percent under 20 years of age suffers from hearing loss, although the degrees of hearing loss are varying (Johansen, 2018). However, despite the high prevalence of this condition, relatively little is known about the outcomes of people with mild-to- moderate hearing loss, and the lack of studies on the field in terms of second language learning remains poor. What needs to be known is that mild and moderate hearing disability can be defined as ranging from pure tone air-conduction thresholds of 15-30 decibels (dB) to 30-70 dB (Mehra et al., 2009). However, these terms are audiological threshold categories, and they do not necessarily reflect student functionality and academic performance. Dalton (2013) states something very important regarding students with mild-to-moderate hearing loss: that these students, compared to for example students with profound hearing loss or deafness, do not receive intensive educational interventions. The reason why, he claims, is that these students seem to do well in classroom settings, and more importantly; they seem to be able to keep up with their peers. It is therefore easy to overlook their challenges, as mentioned. I will discuss the major outcomes of a minimal hearing loss in the next chapter of this paper.

Before explaining minimal hearing loss, it is important to clarify the different levels of hearing impairment. The National Health Interview Survey (1987) defines a deaf person as someone who is “unable to understand speech”, and a hard-of-hearing person as “one who has difficulty understanding speech”. The people suffering from deafness and profound hearing loss are at the one end of the continuum, and normal hearing people are at the opposite end. In between we find people with a minimal-to-moderate hearing loss. Clark (1981) defines these as the levels of hearing loss: Mild loss of 20-40 dB (20 dB is soft-spoken voice); moderate loss of 40-70 dB (40 dB is normal for spoken voice); severe loss of 70-90 dB (shout); profound loss and deafness over 90dB. It is important to note that even though two people have the same level of hearing loss, they may encounter different experiences. Additionally, a mild hearing loss does not imply mild hearing or minimal communication difficulties, which we will get to in the next chapter. Therefore, these definitions are just a rough guide, but individual differences do occur. For example, someone could suffer from a minimal hearing

loss on low-pitch sounds and moderate loss for higher pitch sounds (Bernstein and Oxenham, 2006).

2.1 Minimal hearing impairment – unilateral hearing loss

Throughout this paper I will use the term minimal-to-moderate hearing impairment, however, I am well aware that there are different terms for hearing loss according to where in the ear there has been a damage to the hearing.

People with mild or moderate levels of hearing loss are likely to experience a speech signal that is distorted or degraded, though they do percept more of the sounds than people with more severe hearing loss (Halliday et al., 2017). A type of mild to moderate hearing loss is *unilateral hearing loss*, and is described in the following way by National Workshop on Mild and Unilateral Hearing (2005).:

“A permanent unilateral hearing loss exists when the diagnosis indicates that there is calculated or predicted average pure tone air conduction threshold at 0.5, 1, 2 kHz of any level greater than or equal to 20 dB HL or pure tone air conduction threshold greater than 25 dB HL at two or more frequencies above 2 kHz in the affected ear with an average pure tone air conduction threshold in the good ear less than or equal to 15 dB”.

This means that a person who is born with an unilateral hearing impairment has one ear with any degree of impaired hearing, while the other ear has normal hearing ability (Huttunen et al., 2019). It is suggested that one per 1000 births will be born with unilateral hearing loss, however, the prevalence of UHL increases with age as delayed-onset congenital hearing loss and acquired etiologies emerge (Lieu, 2018). Even though there is a slight difference between minimal hearing impairment on both sides and unilateral hearing loss, the experiences are the same for those suffering from these conditions: they are at higher risk for experiencing academic, speech-language, and social-emotional difficulties as they are not provided with a learning environment that is adjusted to their condition (McKay et al., 2008).

In both conditions one is advised to for example reduce background sound when communicating with a person with either hearing loss condition, and also good acoustics are viewed as important in the learning environment (Huttunen et al., 2019). Therefore, even though they are two slightly different conditions, I will in this paper refer to studies on both fields as studies on minimal-to-moderate hearing impairment, the reason being that one can

see in the existing literature that the outcomes and needs for a facilitated learning environment are the same. Also, Huttunen et al. (2019) argues that “most of children’s UHIs (unilateral hearing impairment) represent the sensorineural type of a mild-to-moderate degree with 20% being conductive cases” (p.4).

2.1.1 Minimal-to-moderate hearing impairment: classroom strategies and consequences

Some actions have been made in order to facilitate a better learning environment for hearing impaired students in the classroom. I will now briefly discuss the most common beliefs regarding the condition and the strategies that are most commonly used in the classroom. However, I will then explain why these actions have not been successful. Thereafter, I will present some studies on the field of the consequences of minimal-to-moderate hearing loss.

Goldberg and Richburg (2004) argues in their paper *Minimal Hearing Impairment: Major Myths with more than Minimal Outcomes* that minimal hearing impairment causes academic differences between hearing and hard-of-hearing peers. It is generally known that deaf and hard of hearingness can cause a delay in language development, and children diagnosed with severe to profound hearing loss are readily identified as needing appropriate intervention at an early stage (Goldberg and Richburg, 2004). At the other end of the continuum are children with minimal hearing impairment. Goldberg and Richburg (2004) stresses in their paper that minimal hearing impairment is too easily overlooked, and that this is mainly due to lack of information: “The overriding theme throughout these recommended strategies is the need to educate parents and professionals who work with students with MHI (minimal hearing impairment), including teachers, administrators, audiologists, SLPs (speech-language pathologist), and school nurses” (Goldberg and Richberg, 2004, p. 159), and also they state that this condition is a “hearing loss not typically identified as a hearing loss” (p.159). The reason why this condition is not taken seriously, they argue, is because students with a minimal hearing impairment often pass the hearing screening, and therefore it is argued that they should have no difficulties in learning in the classroom (p. 156). However, even though students pass their hearing screening, they still remain at risk for not hearing and identifying voiceless and high-frequency consonants in the speech directed towards them (Northern and Downs, 2002). These difficulties occur when they sit in a classroom with a lot of noise, for example, which is very typical for a busy classroom (Goldberg and Richberg, 2004, p. 156).

Furthermore, everyone who suffers from a hearing loss would at one point have experienced being asked by the teacher to take a seat at the very front of the classroom, or as close to the teacher as possible, during their days in elementary to lower secondary school. Investigators on the field have stressed the importance of appropriate seating for years, due to the classroom acoustics and for optimal listening conditions (Bess and McConnell, 1981; Crandell and Smaldino, 2000). What Goldberg and Ricburg (2004) argue is that seating a child with hearing impairment in front of the classroom will result in a sufficient improvement in their hearing ability, however, this will only work if the teacher stays within 3 to 4 meters of the child or faces the child when speaking, as many children rely on lip reading (Crandell and Smaldino, 2000). Goldberg and Richburg (2004) states further that this is not realistic as in reality the teacher moves a lot around the classroom. In theory, preferential seating is a good strategy. Yet, other variables, such as background noise, is also an important factor in order for the child to be able to comprehend what is being said. Several studies have demonstrated that young listeners, both with normal and abnormal hearing, perform poorly in noisy and busy situations, compared to adults (e.g. Elliot, 1979; Soli and Sullivan, 1997). These findings show that even though there are different strategies used to facilitate a better learning environment, they do not simply always work due to other factors, such as acoustics.

2.1.2 Language development in mild-to-moderate hearing loss

Kishon-Rabin et al. (2015) aimed in their study to evaluate the impact of unilateral hearing loss on early communication skills of infants compared to infants with normal hearing levels. 34 infants with unilateral hearing loss and 331 control infants with normal hearing were divided into two groups, and early auditory skills and preverbal vocalization were assessed using questionnaires. They found that auditory behavior as measured by the Infant-Toddler Meaningful Auditory Integration Scale was delayed in 21% of the unilateral hearing loss children compared to 4% in children with normal hearing (Kishon-Rabin et al., 2015).

In a study by Fischer and Lieu (2014), 20 adolescents with unilateral hearing loss were compared to 13 adolescent siblings with normal hearing on standardized language tests (Oral and Written Language Scales) and the Clinical Evaluation of Language Fundamentals (CELF). They found in their study that the group that suffered from unilateral hearing loss had worse overall and expressive language scores than the control group. The results were 98 vs. 114, ($p=0.001$; 100 vs. 114, $p=0.006$) for expressive language, and had significantly lower

full scale (98 vs. 112, $p=0.017$), and verbal (101 vs. 113, $p=0.032$). The findings concluded that unilateral hearing loss in adolescents is associated with a negative effect on standardized language scores (Fischer and Lieu, 2014, p.1).

Bess, et al., (1998) reviewed the existing literature regarding children with minimal hearing impairment and concluded that these children were at risk for not completely developing learning and language skills and faced significant challenges in the classroom despite the seemingly minimal nature of their hearing loss. Methodical issues in the reviewed studies led Bess et al. (1998) to look further into the prevalence of mild hearing loss and the impact on educational performance of mild hearing loss. Using a case control design, Bess et al. (1998) examined the hearing status and educational performance of 1,218 children in third, sixth and ninth grades in the US. Approximately 11% of these children exhibited hearing impairment. Of the study sample, 5,4% were diagnosed with mild hearing loss, documenting that the prevalence of hearing loss in the schools almost doubles when children with minimal losses are included. Something that was of particular interest in the outcome of this study were the third grade children with mild hearing loss. Compared to their hearing peers, these children experienced particularly difficulty with reading, language, attention and communication, also they were more likely to repeat a grade due to not being able to keep up with the educational progress.

2.1.3 Fatigue, psycho-social development, and perception

Huttunen et al. (2019) carried out a systematic review in order to summarize the impact of childrens' unilateral hearing impairment. They argue that research evidence for the impact of permanent unilateral hearing loss on children has been mixed, and also based on small and heterogenous samples. There are few studies on the field, and most of them are related to language learning. However, I will discuss some studies that have been done on the field of consequences of hearing loss that are not related to language acquisition to provide the reader with a deeper insight in the condition.

A cross-sectional study investigated the impact hearing loss had on work participation. The study found that degree of hearing loss was associated with low workability, fatigue, work place accommodations, and also degree of hearing loss was positively associated with being unemployed (Svinndal et al., 2018). Additionally, Svinndal et al. (2018) found in their study that there was a lack of work place accommodation when there was need of such, both for

employees with hearing loss only and for employees with sensory conditions. These findings call for a need for an increased attentiveness to the individual needs concerning the experienced disability a hearing loss may produce, they argued (Svinndal, et al., 2018). However, Halliday et al. (2017, p.1551) found that even when hearing loss is identified, the introduction of hearing devices such as hearing aids and frequency modulation systems only goes so far toward addressing the problem. “In general, whereas these devices boost the intensity of the signal and compress variations in level, they do not rectify many of the perceptual consequences of hearing loss” (Moore, 2007). In Kermit’s (2018) report this problem also is faced for students in educational settings, meaning that even though it is known that a student suffers from hearing loss, and at the same time, it is known what the consequences might be regarding hearing loss, the problem is still too easily overlooked. For students, to be able to keep up in class while being hearing impaired takes a lot of concentration and energy, this is physically draining for the hearing impaired student (Kermit, 2018).

Rekkedal (2014) revealed that teachers of students with mild-to-moderate hearing loss seldom adapted their teaching or implemented microphones, whereas teachers of students with severe hearing loss regularly implemented microphones and adapted their teaching. Teachers of students with mild-to-moderate hearing loss also reported less knowledge about hearing impairment compared to teachers of students with severe hearing loss, which was related to the usage of microphones. The teacher’s willingness to implement microphones and make necessary adjustments is therefore of importance. Some teachers do not want to teach children with hearing loss because they do not have the necessary skills and are overloaded or do not get enough support in their work (Berndsen and Luckner 2012). In addition, teachers and schools define and organize inclusive schools differently. Jenssen (2011) revealed that the majority of Norwegian teachers practices inclusive teaching as segregated teaching, whereas the minority of the teachers viewed inclusive teaching as an adapting of the general teaching.

Williams and Finnegan (2003) provided in their article valuable information for educators and teachers to debunk myths and misunderstandings that exist concerning the learning abilities of children who are deaf or have severe hearing impairments. As they stated, “people’s perceptions determine their actions. Consequently, teacher’s perceptions determine the actions that form the basis of their instructional plans and accommodations for students, replacing fallacy with reality is an important first step towards maximizing students’ learning potential” (p.40). It is therefore important that educators are able to know why and how they

can facilitate a better learning environment for hard of hearing students, and that the major implications a minimal-to-moderate hearing loss can have is well known amongst teachers.

3.0 Second language acquisition

This paper will mainly discuss the phenomena and ideas within the field of SLA, and therefore it is important to first of all define the term *second language acquisition*. Gass (2003) defines The field of SLA as the study of acquisition of a language that goes beyond the native language. SLA is the process of learning another language after the native language has been learned, and it can also refer to the third and fourth additional language (Gass, 2003). In this paper I will use the terms L1 and L2 when speaking about the Norwegian and English language, where L1 refers to the mother tongue (Norwegian in this paper) and L2 refers to the second language acquired (English in this paper). Smith (1995) describes second language learning in the following way: “[it] normally stands as a cover term for any language learned by a given learner or group a) irrespective of the type of learning environment and b) irrespective of the number of non-native languages possessed by the learner” (p.7). Second language includes both foreign languages and languages which are not one’s mother tongue but are nevertheless spoken regularly in one’s own community (Smith, 1995, p.7).

The term *language* also needs some consideration. Language is considered as a system of form-meaning mappings that is used for communication, and a language contains the subcomponents grammar, vocabulary, and pronunciation (Housen and Pierrard, 2005). Furthermore, *acquisition* is a relatively more complex term to define. Traditionally, acquisition and learning are two terms that have been used to refer to similar constructs, and in this paper learning and acquisition will be used interchangeably. Loewen and Reinders (2011) define acquisition as ‘the process of L2 development’ (p.6) However, Loewen (2020) argues that there are slightly different connotations between acquisition and development, with the former emphasizing the end product of learning, while the latter underscores the process of learning, but in both processes there is the notion of an increase in L2 knowledge and/or proficiency. Loewen (2020) claims that the idea of an increased L2 knowledge and/or proficiency is what we can define as *acquisition*. In the study I carry out it is not possible to document whether the participants increase their learning, namely if they learn something new. What can be documented, however, is what subtitle condition leads to increased L2 knowledge, or L2 acquisition.

It is generally known that at least one language (the native language) is acquired before one begins to learn a second language. However, even though the process of SLA is different than

from learning the first language or native language, Saville-Troike (2006) claims that it is agreed that a major component of the initial state for L2 learning must be prior knowledge of L1 (p.18). It is claimed that the L1 knowledge is transferred to the L2 knowledge, and that it influences the learning process (Saville-Troike, 2006). Individual factors plays a part in learning a second language, level of hearing is of course one of those factors, but also the age of the learner when he first was exposed to and started to learn the second language has been seen as a factor of importance. I will discuss the age factor, amongst others, in the next section of this chapter.

3.1 Theories and approaches to second language learning- brief overview

The age factor is the most critical factor in language learning, according to Lenneberg (1967), so important that he developed a hypothesis called *The critical period hypothesis*. The critical period hypothesis has been widely debated since the 1960s, and it claims that there is a critical period for language learning, namely before the age of puberty (12-13 years) (Lenneberg, 1967). A strong implication of this hypothesis is that the processes involved in any language acquisition after the age of puberty will be different from those involved in first language acquisition (Lenneberg, 1967). This hypothesis has as stated been heavily argued, however, researchers seems to agree that “young starters seem to end up as nativelike speakers of the L2, which is rarely, if ever, the case for adult or adolescent starters” (Hyltenstam and Abrahamsson, 2003, p. 546).

A second theory is based on the assumption that humans are born with a universal grammar. Universal Grammar (UG) is a generativist theory of language acquisition that originated to account for first language acquisition, and has come to be used in SLA as well. UG views language use as based on an innate, abstract linguistic system that is unconscious (Rothman and Slabakova, 2018). Acquisition occurs when the unconscious linguistic system receives input, and extracts rules and patterns that conform to universal linguistic constraints (Loewen, 2020). Loewen (2020) claims further that generativist approaches can provide evidence regarding the natural orders of acquisition, namely the learnability of certain L2 features. For teachers it can be useful to have knowledge about what linguistic features in a L2 are more difficult for the learner to actually acquire, so that these features can be highlighted in the classroom.

Thirdly, Usage-Based Approaches to L2 learning suggest that learners unconsciously register linguistic patterns in the input, and these patterns are strengthened when learners encounter multiple examples in the input (Ellis and Wulff, 2015). Due to modern research methods and new technology over the past two decades, usage-based approaches have gained increasing attention from researchers. Teachers can use new findings to manipulate classroom input of specific linguistic structures to affect cognitive processes to optimize L2 development.

Finally, the sociocultural theory approach to SLA sees the process of learning as a mediated process. It is mediated both through learners' developing use and control of mental tools and it is socially mediated through interaction and shared processes such as problem solving and discussing (Loewen, 2020) Such a social construction may be in education situations. Human social interaction, in which more expert individuals help scaffold novice individuals into higher level of performance, are crucial for development (Loewen, 2020). This is true of the normal education situation regarding SLA. Saville-Troike (2006) argues that a second language can be learned informally and formally. Informal learning happens, he argues, in a natural context, whereas formal learning happens in the classroom (p.2). Both informal and formal learning will be of relevance in this paper, as watching films and video clips is something that you do inside and outside of the classroom.

In addition to theoretical perspectives concerning the efficacy of instruction, there have been numerous empirical studies weighing in on this issue. Long (1996) conducted a study that sought to find if second language instruction made a difference. After having reviewed 12 studies, he concluded that second language instruction did make a difference. Regarding second language learning instruction, I argue that it is crucial for the learner to hear and understand what is being discussed in the ESL classroom, and the educator must focus on how the target language can be easily accessed by the learners who because of different conditions find it difficult to comprehend what is being taught in the classroom. All successful teaching depends on learning: there is no point in providing entertaining, lively, well-constructed language lessons if students do not learn from them (Cook, 2013). It is therefore important that the teacher is aware of what the student brings into the classroom in terms of their language background, in order to facilitate lessons that provide successful learning.

4.0 The role of input in second language acquisition

One of the major theoretical premises at the core of this study is the role of input, amongst others. Listening and reading provide input, and give us some sense of how we are supposed to use language. According to Verspoor, et al. (2009), input is a critical factor for language acquisition. Input has a huge role in SLA, however, it is considered that it is difficult to learn a new language by only being exposed to the target language input, the learner also need output, interaction and instruction. However, Verspoor and Winitz (1997) found in their study that for intermediate learners of English as a SLA, input can be beneficiary alone to improve their receptive English vocabulary, grammar, and reading skills.

Gass and Selinker (1994) mentions in their paper Corder's (1967) distinction between input and intake. According to Corder, language input refers to what is available to be utilized by language learners for SLA, which should be differentiated from intake which is that part of the input that is comprehended by the language learners. Furthermore, Gass and Selinker (1994) describe input as "all exposure to the language", and intake is defined as "what is actually internalized" (p.200). This suggests that input alone is not something that facilitates language learning, the learner also need to be able to understand and be able to process the input in order for it to make sense. This is an important argument regarding input in this study because the participants chosen were only chosen due to their hearing impairment. For second language teachers it is important to acknowledge that the input that he or she is providing the students with is at an approachable level. As Verspoor et al. (2009) put it: "first or second language development is an iterative process which means that the present state of the learning system is the result of all previous steps or iterations" (p.71). Learners of English as a second language are not a homogenous group of individuals, they have been through different steps in the process, and this is something the educator need to keep in mind. The input can therefore be argued to only be effective if adapted to the learner's level, both when it comes to L2 proficiency, and level of hearing.

Dahl and Vulchanova (2014) conducted a study named *Naturalistic acquisition in an early language classroom* where they had some interesting findings. First, it is generally known that second language learning must happen at an early stage of life in order for the speaker to become a successful user of the language (Johnson and Newport, 1989; Hyltenstam, 1992; DeKeyser, 2000; Singleton and Ryan, 2004). However, the most crucial factor is general exposure to the target language, and Dahl and Vulchanova (2014) claims that: "We know that

L2 learners are fully capable of acquiring linguistic knowledge without intentional effort or instruction, and that reading and listening alone can lead to acquisition especially in young learners” (p.1). Dahl and Vulchanova (2014) used the Peabody Picture Vocabulary Test on two 60 first-grade pupils in two Norwegian elementary schools. The control group followed regular instruction as prescribed by the school curriculum, while the experimental group received increased naturalistic target language input. The test was ran at the beginning and at the end of the first year of school. They found that the second group of young ESL learners of English benefited from being exposed to increased naturalistic input, and an increased amount of that input. This study’s findings support the claim that input is important in language learning, and it also states that it is important for learners to be exposed a lot to the target language. In this current study it will mean that exposing the learners to L2 subtitles will be more beneficial for their second language learning in the long term.

5.0 Films in education

Using films in education is great for language learning as it provides the learners with authentic language material. Also, for many students are films their only and initial contact with English-speaking culture. Films can bring variety and flexibility to the language classroom by broadening the choice of techniques and resources, aiding students in developing communicative skills (Jeng, et al., 2009). In many ways, using films is the most economic and time efficient method when learning about for example other cultures, as it is all placed in the classroom and the teacher can choose films out from what topics they are working on (Knee, 2001). For instance, an entire film or part could be used to practice listening and reading, and as a device for speaking and writing. Kaiser (2011) argues that films can also be used as a spring-board for follow-up activities such as discussions and debates on a chosen topic out from what the students have watched.

Motivation is amongst the crucial factors in considering effective second-language acquisition (Liversidge, 2001). Mirvan (2013) studied the advantages of using films to enhance student’s reading skills in the EFL classroom. The total sample of participants consisted of 80 students, male and female, in a multicultural classroom. The participants were divided into two groups over a four month period, where one group followed regular teaching and the other group implemented films a lot more. What the study found was that motivational factors associated with movie-based teaching helped to increase the efficiency of the teaching and learning process.

5.1 Audiovisual material as input

The type of input the students are exposed to is of great importance in order to make language learning happen. Audiovisual material can be a good source of authentic input, as it offers a much richer source of input for learners and have the potential to be exploited in different ways, and also on different levels (Gilmore, 2007, p. 103). For many students, films are their initial contact with English-speaking culture, and are useful because the students get to listen to authentic spoken communication and exposed to various features of spoken communication, such as vocabulary, voice modulation, accent, speech pace and tone (Sherman, 2003). Authentic videos, as opposed to ready L2 materials aimed at foreign/second language learners, are created for native speakers and they are considered beneficial for foreign language learners (Frumuselu et al., 2015). They present real input in real life communicative situations, which is what students need: raw and unedited language input (Talaván, 2007). They also present colloquial English in real life contexts rather than artificial situations, and therefore students are exposed to a wide range of English speakers, each with their own slang, reduced speech, stress, accents and dialects (Mitterer and McQueen, 2009).

In L2 speech processing, the focus is often on the importance of authentic auditory input, however, in many instances, speech communication involves both visual and auditory sources of information (Hardison, 2010). Combining authentic speech with subtitles is therefore *alpha omega* in L2 speech processing. For hard of hearing people the visual input they often rely on is lip reading as it functions as complementary source of important for the perception of speech when the auditory perception is weak. Therefore, using films in education gives the hearing impaired learner a great opportunity to comprehend what is being said, as it provides both auditory and visual input.

Subtitles are tools that are frequently used in audiovisual material, and for hard of hearing learners this is a further complementary source in order to aid comprehension. Bravo (2008) claims that “subtitles offer a written transfer of authentic contextualized language and not fabricated foreign language learning materials” (p.89), thus, students are exposed to authentic language and cultural information through several channels: visual, oral and written in an authentic setting. With ‘written’ we mean subtitles. Reading the dialogue in context while listening to the language stimulates learners to consolidate what they are learning, enriching their vocabulary and making them familiar with the culture of the foreign language in an authentic setting (Frumuselu et al., 2015). Films are among the audiovisual materials on the

market that is frequently pedagogically implemented, and is a highly appropriate source for authentic input in the target language (Danan, 2004).

5.1.1 Dual Coding Theory

Trenkic (2015) states that bi-modal describes the simultaneous presentation of matching aural and orthographic stimuli. For example, someone watching a subtitled film reading the sentence “good morning, mate” whilst concurrently hearing it spoken by one of the actors. This phenomena gained prominence in the early 1980s and was called Dual Coding Theory (Paivo, 1986). Paivo’s idea was that the brain processes verbal and non-verbal stimuli via two different cognitive systems; but that these systems interact with one another when both are activated, resulting in better memory recall, and Charles and Trenkic (2015) claims:

“For example, when L2 learners of English are presented with an image of a tiger (non-verbal stimuli) whilst being told ‘this is a tiger’ (verbal stimuli), they are later better able to recall the word ‘tiger’ compared to learners who are only exposed to one form of stimuli” (p.4)

The main idea of this theory is that two sources of input may lead to better learning outcomes. This theory can be transferred to the reading of subtitles whilst seeing what is happening on the screen, and that this activates the visual and auditory parts of the verbal system that again will lead to a better learning and comprehension outcome (Charles and Trenkic, 2015).

5.1.2 A cognitive theory of multimedia learning – “multimedia principle”

The cognitive theory of multimedia learning argues for the same processes as the dual coding theory. The principle known as the “multimedia principle” states that “people learn more deeply from words and pictures than from words alone” (Mayer, 1997, p.47). However, simply adding words to pictures is not an effective way to achieve multimedia learning. The goal is to instructional media in the light of how human mind works. This is the basis for Mayer’s cognitive theory of multimedia learning. According to Mayer’s (1997) cognitive theory of multimedia learning, the learner possesses a visual information processing system and verbal information processing, such that auditory narration goes into the verbal system whereas animation goes into the visual system. It is argued that in multimedia learning the learner engages in three important cognitive processes: selecting, organizing, and integrating.

“The first cognitive process, selecting, is applied to incoming verbal information and is applied to the incoming visual information to yield an image base. The second cognitive process, organizing, is applied to the word base to create a verbally-based model of the to-be-explained system. Finally, the third process, integrating, occurs when the learner builds connections between corresponding events in the verbally-based model and the visually-based model” (Mayer, 1997, p. 2).

From this theory of how learners process multimedia information, Mayer and Moreno (2000) worked out principles for multimedia learning that might be helpful for teachers who wish to aid learning with help of subtitles. I will shortly explain the principles below:

Firstly, it is the “Multimedia Representation Principle: It is better to present an explanation in words and pictures than solely in words” (p.2). This principle is worked out due to the theory of how different mental representations strengthens learning and memory.

Second, the “Contiguity Principle: When giving a multimedia explanation, present corresponding words and pictures contiguously rather than separately” (p.3). Mayer and Moreno (2000) claim that students better understand an explanation when corresponding words and pictures are presented at the same time rather than separated.

Third, “Split-Attention Principle: When giving a multimedia explanation, present words as auditory narration rather than visual on-screen text” (p.3). This principle state that words should be presented auditorily rather than visually, and that the two sources should not be separated.

Fourth, the “Individual Differences Principle: The foregoing principles are more important for low-knowledge than high-knowledge learners, and for high-spatial rather than low-spatial learners” (p.4). According to cognitive theory of multimedia learning, students with high spatial ability are able to hold the visual image in visual working memory and thus are more likely to benefit from presentation of words and pictures. Individual differences plays a role in how much the different learners will benefit from multimedia.

Fifth and final, the “Coherence Principle: When giving a multimedia explanation, use few rather than many extraneous words and pictures” (p.4). This principle claims that students learn better from a coherent summary which highlights the relevant words and pictures than

from a longer version of the summary. A shorter presentation primes the learner to select relevant information and organize it productively.

These principles are worked out from what we know about language processing although they are subject to further testing in order to verify them as true or not. However, this work demonstrates how it is possible to take a learner-approach to instructional technology, and might function as a guide for teachers who wish to implement multimedia in their classroom (Mayer and Moreno, 2000).

5.2 Studies on bi-modal input and language learning/comprehension

Markham (1989) conducted a study that sought to investigate the role of bi-modal input on second language *listening* comprehension. The participants were 76 university-level students studying English as a second language. The participants watched a TV programme without subtitles, then another TV programme with subtitles (bi-modal input). After each viewing session the participants underwent multiple-choice reading comprehension tasks. The results indicated that participants demonstrated better performance on the test after being exposed to bi-modal input than after they had watched the programme without subtitles. This finding led to the claim that bi-modal input improved listening comprehension. Even though Markham's (1989) study has gained critique on its validity, it is a great way of testing comprehension on deaf and hard of hearing students. This is because in a classroom where a film is shown for educational purposes, a student struggling with hearing impairment may not be able to pick up all the information streamed through the TV-screen, and therefore he/she has to rely on reading the subtitles in order to be able to understand what the program is about and what is being said. Therefore, one might argue that even though subtitles will not improve *listening*, the presence of subtitles and bi-modal input will improve general comprehension of the material that is being shown.

In a later study, but with the same study design, Markham et al. (2001) included a condition with L1 subtitles. This study still showed superior performance of the bi-modal group (L2 subtitles) compared to the no-subtitles group and the L1 group. They concluded that if the effect was one of general comprehension only, both L1 and L2 subtitles groups would perform equally well. In my study I am interested in what subtitles case they are able to benefit most from, but not in terms of listening skills as Markham et al. (1989, 2001) was interested in.

6.0 Subtitles for hearing impaired viewers

Even though the use of subtitles has increased the last decade, the study on the field of subtitles for hard of hearing remains limited (Orero, 2004). Most of the studies are on the deaf audience, and very little is related to the use of subtitles in language learning. However, it is generally understood that subtitling is an important tool for hearing impaired people to understand television programs for example (Neves, 2008). The concept of subtitling may be defined in the following way:

“Subtitling may be defined as a translation practice that consists of presenting a written text, generally on the lower part of the screen, that endeavors to recount the original dialogue of the speakers, as well as the discursive elements that appear in the image (letters, inserts, graffiti, inscriptions, placards, and the like) and the information that is contained on the soundtrack (songs, voices off)” (Díaz-Cintas and Remael, 2014, p.8).

Furthermore, there are different types of subtitles. Gottlieb (1997) characterizes subtitles from a linguistic and technical perspective: Linguistically we have intralingual and interlingual subtitling. Both the subtitling of local programmes, subtitled in the same language for the deaf and hard of hearing, and subtitles for people learning languages fall within this group.

Technically, he argues that there are open subtitles and closed subtitles. Open subtitles go with the original film or the television version. Closed subtitles can be added voluntarily, and they include noises, speaker differentiation etc. (p.71).

A question therefore to be asked is what kind of subtitles would be best for people who suffer from deaf or hard of hearingness. Szarkowska et al. (2011) asks in their study what kind of captions should be used. Should it be *verbatim* – that is, in the form of a literal and faithful transcription of the dialogue list- or should be *edited*- that is, condensed and simplified in order to foster comprehension and facilitate the reading process, i.e. closed subtitles/captions (Szarkowska et al., 2011). By examining eye movement patterns of three groups of study participants (deaf, hard of hearing, and hearing) as they watched three captioned video clips- one verbatim, one standard, and one edited- they aimed to establish whether the three groups of participants read the three different captions styles differently and which type of captions would be optimal for the deaf and hard of hearing viewers. The analysis of dwell time suggested that edited captions were the easiest to process for all groups of viewers. Standard captions, however, appeared to be almost as good in this respect: when they were used, the

participants gave approximately equal amounts of time to watching the image and reading the caption. Both edited and standard captions seemed to leave the viewers at relative ease during the dual task situation, that is, constant switching between reading and viewing. Although verbatim captions do provide viewers with the highest number of details and are not simplified, they are also extreme gaze attractors, especially for the deaf and the hard of hearing. Standard captions turned out to be the optional solution (Szarkowska et al., 2011, p. 376)

7.0 Method

This study is a deductive research as it builds on an hypothesis. Given that hard of hearing individuals might rely more on visual cues in auditory language processing, the purpose of this study was to investigate whether subtitles can facilitate language processing, and if so, which subtitles would be more beneficial for hard of hearing students.

The aim of the study is to try to shed light on the matter of respective benefits of subtitles for comprehension and vocabulary aspects. For this project, I investigated how different types of subtitles influenced understanding of three short videos with English speaking audio material, and subtitles in two different languages, and one condition without subtitles. The main issue has been to look for a hypothetical influence of subtitles on comprehension and language learning among hard of hearing learners of English. The main idea of this study was to research how visual cues could lead to second language acquisition amongst hard of hearing students, but the idea of studying subtitles as visual cues was inspired by Vulchanova's et al. (2015) study on effects of subtitles in the context of authentic material on second language comprehension, and potentially second language acquisition for Norwegian learners of English. The method, having three cases of subtitles, was carried out the same way in my study, however, the major distinction is this study's scope on hard of hearing students. This study also examines the perspectives of the students and reports their voices in an effort to better understand how subtitles can impact their experience in terms of language comprehension.

My research question was if there was a subtitle scenario that was more beneficial for the learners than the others. The main method was based on quantitative study principles. Rasinger (2010) claims that quantitative methods are more concerned with the question *how much* and *how many*, and the data found using quantitative method can be analyzed using statistical methods. For this study, as I wanted to use several participants, I decided on a quantitative approach. As I also wanted to involve the participants' view on subtitles as a language learning tool I had a section at the end of my survey where they could write a short comment on the case, and I asked if they thought subtitles could be a helpful tool for second language learners and what condition they found to be most helpful when watching the film clips. This is the qualitative part of the study. Berg (2009, p.3) argues that: "Qualitative

research refers to the meanings, concepts, definitions characteristics, metaphors, symbols, and descriptions of things. In contrast, quantitative research refers to counts and measures of things”.

I wanted to involve the participants’ views on the subtitle vs. no subtitle situation, and why/if they thought including subtitled viewing material would improve second language comprehension. Kermit (2018) reported that the main problem regarding had of hearing students was actually the lack of knowledge that the teachers had on the field. My goal is that this paper should be informational on the topic of hard of hearingness, especially for educators who teach students with suffers from a hearing loss. Therefore I find it important to include students’ views on the topic, and how/if being provided with such a tool is beneficial for them.

This is a within-subjects study design, meaning that the same person tests all conditions and also, the participants are expected to share similarities, and act in accord with some pattern (Charness et al., 2012). In this study the participants were chosen due to hearing loss and being learners of English as a second language. Furthermore, Angouri (2010) states that the studies carried out in the field of linguistics often subscribe to either the quantitative or qualitative paradigm, but that it is more or less common that the studies carried out fall somewhere between the two ends of the continuum. Greene et al. (1989) reviewed studies taking a mixed methods approach and argued that combining the two paradigms is beneficial for constructing comprehensive accounts and providing answers to a wider range of research questions. The comments from the participants will be interesting in my discussion, however, even though asking for their opinion is a qualitative approach, the method used in the main study is a quantitative one. Quantitative studies aim to result in findings that are statistically likely to generalize to the whole user population. Like in any scientific experiment in which we want to detect causal relationships, a quantitative study involves two types of variables: independent and dependent variable. Nenty (2009) states that:

“The dependent variable is the problem variable while the independent variable is that whose influence or relationship to the problem variable established, and which is effectively manipulated is highly likely to bring about desirable changes in the problem variable” (p.19).

I had three conditions, and within each condition I had two variables: comprehension test and the vocabulary test. The independent variable is the participants’ level of hearing. The three

conditions and the performance accuracy variables are within participant variables, and the level of hearing is between participants. I used a type of experimental design, meaning that I could manipulate the variables and thereby approve or disprove the hypothesis (Rasinger, 2010). There is a great deal of research in linguistics that is not aimed at supporting or attacking any coherent theory. This research is rather aimed at solving practical, real problems that confront society (Salkind, 2010). The experiment itself is designed for practical ends, i.e. to decide if subtitles can function as a language learning tool, and especially if hard of hearing learners find subtitles to be beneficial. My hypothesis was that English subtitles would be beneficial. This type of research was a deductive one, meaning that I set out a hypothesis based on the theory or an assumption already known (Rasinger, 2010). The performances of the variables, and the numerical data was statistically analyzed in SPSS.

7.1 Participants

14 learners of English from the age group 18-25 years of age participated in this experiment. All participants were native speakers of Norwegian and had varying degrees of hearing loss and of English speaking proficiency. The only demand to the participants was that they had a detected hearing loss and were learners of English. The study did not require any particular proficiency of English, however, the participants were asked to rate their own English writing, reading and communication skills. This factor could be of interest in the discussion chapter, however, it was found that they all rated themselves as conversational to fluent speakers of English, and therefore I did not consider this factor when measuring their data as they were all on the same level, more or less. The initial idea for this project was to recruit participants who lived nearby and carry out the experiment in a classroom where I would guide the participants through the project. In order to find participants that struggled with abnormal hearing levels I contacted HLFU (hørselshemmedes landsorganisasjon for ungdom) in Trondheim. I sent out information about the project to the members of the organization and asked if they would be interested in participating in my study. I was not able to gather any participants from that organization, however, as members of that group had spread the word about my projects in other groups for hard of hearing people on Facebook, I got messages from people outside of Trondheim who wanted to participate. Therefore, I decided with my guidance instructor, Mila Vulchanova, that it would be best to make an online survey so that I could reach out to the participants who wanted to partake in the study but lived outside of Trondheim. Because of the fact that I was not able to handpick participants out from levels of proficiency, linguistic

background, hearing levels, etc., I decided that the only requirement for participating in this study would be reported hard of hearingness and being a learner of English as a second language. In the study the participants were asked to give information about their hearing loss. 8 of the participants reported hearing levels of 26-40 dB: mild hearing loss, and 6 of the participants reported moderate hearing loss: 41-55 dB. For confidentiality reasons the participants were named S1-S14, where S stands for subject and the numbers 1-14 were randomized.

7.2 Materials

Before the tests were created, I had to find suitable video clips to show and base my questions on. I decided to use a documentary called *Expedition Happiness*. The reason why I chose a documentary was mainly because documentaries are widely used in English as a second language classrooms, and because a documentary contains detailed explanations which might facilitate initial stages of word learning and comprehension. There were no additional music that could be disturbing for the participants in the documentary. The documentary was up to 60 minutes long, however, I chose scenes that were approximately 5-6 minutes. I transcribed three scenes into three versions: Norwegian (L1) subtitles, English (L2) subtitles, and no subtitles. I then studied the script and the subtitles side by side, to seek phrases and words that would be relevant to use in my study. I used Netflix clips in my investigation because Netflix provides closed captioning for their English subtitles. Netflix was the only streaming site in Norway where one could choose between Norwegian subtitles, to English subtitles (with closed captioning), and to no subtitles, which is why I had to use this site as my source. When I planned this study I expected to find differences between performance on the tasks in the three conditions with different subtitles. For each film clip scenario I made 3 questionnaires about comprehension, and 3 on word and vocabulary tasks, which meant that they would answer 6 questions after each scene (appendix 2). They were able to get a point for each question they answered right, meaning that a participant could score 18 points all together.

7.3 Background questionnaire

In the background questionnaire I asked about the participant's name, only for categorization reasons, as their names were anonymized in the analysis process. I also asked about their age, level of English proficiency and level of hearing. That they could report minimal-to-moderate hearing loss levels was of great importance, and as mentioned, the only requirement besides being a learner of English as a second language in order to partake in the study. I listed the different hearing levels (appendix 2) as a part of the background questionnaire and the participants were asked to choose the answer that was their result from their last screening. If it had been a long time since they had taken a hearing test or they could not remember their results I asked them to take ReSound's online hearing test that only took them 3 minutes. For the sake of validity I personally took this hearing test and compared it to the results from my last hearing screening. My last screening was 6 months ago and the online test showed accurate results compared to the screening. The reason why I chose to use the ReSound hearing test was because of its validity as ReSound makes hearing aids and is a well-known name in the hearing impaired community, and also because of efficiency as it only took 3 minutes.

The levels of proficiency were rated from basic- conversational – fluent – proficient. They were all described and the participants were asked to mark a X for their answer (appendix 2). I described the levels according to CEFR levels (Milton, 2010). Initially, these answers were not considered the most important piece of the testing, as it documented more or less similar results for all participants. However, the results regarding their English level proficiency were important for mapping the participants and as a part of the discussion.

7.4 Comprehension task

I made comprehension tasks that followed the viewing of the three video clips where the participants were to receive the questions and answer them immediately after they had watched a video clip. This test would check if the participants were able to understand what had been discussed in what they saw, and if they comprehended the overall plot. One example could be "Where does Felix come from?" (appendix 3) and I would give three choices that sounded similar, where one of them were correct, plus the answer "I do not know". The reason why I included "I do not know" was simply because if the participants did not hear or could not remember the answer they should not be forced to guess an answer that they were

unsure of being correct. The aim of this task was to measure the extent to which the participants had been able to comprehend the actions in the clip, and the task did not focus on language as such. The comprehension questionnaire was designed in a multiple choice format. As mentioned, there were one correct answer, two answers that sounded the same or was near being the same as the correct one, and they could also choose to answer “I do not know”.

7.5 Word definition and vocabulary task

The main research question in this study concerns whether Norwegian or English subtitles make it easier for the students to learn English. Of course I could not assess to what extent these items were new to the participants, but at least they were all newly activated in the video they saw.

I created a word definition task where the participants would choose between four definitions of a word or a phrase. Among the alternatives there was one correct answer. The words and phrases were all taken from the transcribed text of the film clip, and were chosen because they were interesting words. One case of word task could be to fill in the correct words missing in a utterance that was said during the scene, for example: “Usually it’s all ...”, and there would be four alternatives: sold out, full, booked out, or I do not know. The questions came right after the comprehension task so that the participants would have done some recap of the 5-6 minute long film clip. They would also be asked to define words such as “repulsion”, and other words that could be defined out from the context in the film clips even if they did not know about them before watching the clip.

7.6 Procedure

The participants were given information about the study before they answered the online test, they were given information about both the aim of the study and the procedure. The main reason for providing this much information about the project was so that people who did not fit into my group of people of interest (hard of hearing, learners of English as second language) would take the test. Those who wanted to partake in the study clicked on “I agree” in the beginning of the test where I had described the study and added a version of the consent form from NSD (appendix 1).

I had three conditions: 1) Video only, no subtitles (no text) (unimodal condition), 2) Video with subtitles in English (bi-modal intralingual condition) and 3) Video with subtitles in

Norwegian (bi-modal interlingual condition). The participants were asked 2 types of questions: questions about what they had seen and what they talked about, and word definition and vocabulary questions. The three clips lasted for 5-6 minutes each, and I designed the study so that they were not able to go back and watch it again, nor do the study twice. The dialog between the two people in the documentary was spoken in an American accent, and was believed to be comprehensible to the participants. The participants spent an overall 25-35 minutes on the survey.

7.7 Validity and reliability

Two important measures in quantitative study are validity and reliability. The aim of this study was to check for potential second language learning and comprehension from subtitles amongst learners with a mild-to-moderate hearing loss. Therefore, the study would be more accurate with a larger sample size. Furthermore, validity is defined as “the extent to which a concept is accurately measured” (Heale and Twycross, 2015, p.66). For example, this study was designed a learning outcome, however, if it actually measured simple memorization of what the participants saw then it would not be considered valid. The results from this study shows that this is not the case though, as it shows a pattern in the participants’ answers. Quantitative research paradigm emphasizes the importance of generalizability and reliability (Henn et al., 2006), and therefore a representative sample of the population is essential. As mentioned, this study’s participant sample is fairly small. One can argue that 14 participants is not a sufficient amount of participants to call it a valid sample size and that it is not enough to say something about generalization. However, as mentioned, this study is more concerned with investigating and identifying the general patterns in the data, and is therefore more exploratory in nature than concerned with statistical hypothesis testing. Furthermore, a criterion for reliable results is that they can be reproduced and repeated (Postholm, 2010, p.169). This study can be reproduced, however, the results could vary according to other participants’ proficiency, age, and even within hearing levels.

8.0 Analysis

For the analysis, the participants' level of hearing was used as the independent variable, whereas comprehension and vocabulary accuracy were used as dependent variables. The results focus on the condition and rate of accuracy. The data set was small, and a Shapiro-Wilk test revealed that the data therefore did not follow a normal distribution. In each set of questions the participants were able to get 0 to 3 points.

Table 1 summarizes the descriptive statistics for the group of participants. A Shapiro-Wilk test for normality was also applied to each variable. Based on the results showed in table 1 we see that the mean score is the highest in the English subtitle condition, and the lowest in the no subtitle condition. This shows that the group had higher accuracy scores on the English subtitle condition.

8.1 Results from Shapiro-Wilk test

TABLE 1. Descriptive statistics from analysis based on score

Condition	Mean	SD	Shapiro-Wilk test
<i>Norwegian subtitles comprehension</i>	2.07	0.730046	p= 0.00936921
<i>Norwegian subtitles vocabulary</i>	2.42	0.646206	p= 0.00159208
<i>English subtitles comprehension</i>	2.85	0.363137	p= 0.00000170776
<i>English subtitles vocabulary</i>	2.64	0.497245	p=0.0000565034
<i>No subtitles comprehension</i>	1.5	1.019049	p=0.0515890
<i>No subtitles vocabulary</i>	1.7	0.611250	p=0.00209680

The next step was to run the Wilcoxon-test in SPSS. The Wilcoxon- test is a nonparametric test that does not assume normality in the dataset, and is used to compare two sets of scores that come from the same participant, furthermore we run this test to investigate any change in scores from when individuals are subjected to more than one condition (Statistics Solutions, 2020). Therefore, in order to analyze the data I split the participants into minimal hearing loss versus moderate hearing loss. Thereafter, I analyzed the scores for the different conditions

and variables. The test showed if there was an overlap, or lack of, between the distributions to see if they were significantly different or not.

8.2 Results from Wilcoxon test

TABLE 2. Wilcoxon test

Variable tested	Level of hearing	Conditions compared	Z	p=	
<i>Comprehension</i>	Minimal	English subtitles & Norwegian subtitles	-2.000	0.046	
		English subtitles & No subtitles	-1.730	0.084	
		Norwegian subtitles & No subtitles	-0.552	0.58	
		Moderate	English subtitles & Norwegian subtitles	-2.333	0.020
		Moderate	English subtitles & No subtitles	-2.232	0.026
			Norwegian subtitles & No subtitles	-2.121	0.034
		Minimal	English subtitles & Norwegian subtitles	-1.000	0.31
			English subtitles & No subtitles	-2.121	0.034
<i>Vocabulary</i>	Minimal	Norwegian subtitles & No subtitles	-2.000	0.046	
		Moderate	English subtitles & Norwegian subtitles	-.577	0.564
		Moderate	English subtitles & No subtitles	-2.121	0.034
			Norwegian subtitles & No subtitles	-1.890	0.059

The results show that there are clearer results primarily for comprehension, and for the moderate hearing loss group. English subtitles over English subtitles showed -2.232, which indicates that it is a great difference between the correct answers between the two conditions. I also get a significant difference for the minimal hearing loss group on English subtitles over Norwegian subtitles: -2.000.

By providing subtitle support in the target language the participants were able to comprehend more of the plot, and subtitles did enhance comprehension specifically. This makes sense as the participants struggle to perceive the auditory input in the source language, and therefore need additional evidence of the form of this input via the subtitles. However, on Norwegian subtitles vs English subtitles it appears that the difference is not that great, with -1.000 for minimal hearing loss on vocabulary, and -.577 for the moderate hearing group on the vocabulary condition. Compared to the Norwegian subtitles, the latter would be more challenging, as they will need to access the target words also in their Norwegian lexicon (connections between the two lexical systems, English and Norwegian), in order to activate also the English meaning. So, essentially what they are doing is L2 (sound) – L1 (sound and meaning)- back to L2 (meaning). This might be a more demanding process, and success will depend on the strength of those links (L1-L2 lexicon) (Havas and Vulchanova, 2018). We find support of these results in priming experiments in bilinguals showing that priming is faster and more efficient if you go from L1 to L2, but priming is either not found or is much weaker if you go from L2 to L1 (Havas and Vulchanova, 2018). This is exactly why we are getting stronger effects for the English condition.

Initially, subtitles facilitate primarily comprehension, word learning needs more time, and more exposure

9.0 Discussion

Based on the results, subtitles clearly aids vocabulary and comprehension for learners of English with mild-to-moderate hearing loss. Films with subtitles can be beneficial. A number of studies support the idea that language learners can use the imagery associated with videos to assist information processing. Research on listening shows that the presence of images has a positive impact on comprehension (Jones and Plass, 2002). Furthermore, using a documentary is beneficial for a number of reasons, and Pujadas and Munoz (2019) argue that the media of TV programs complies with Nation's (2007) five conditions for suitable input: it is processed in large quantities; is familiar to the language learners; provides contextual cues (i.e., through image and dialogue); is comprehensible (Rodgers and Webb, 2011); and is engaging (Webb, 2010).

9.1 The comprehension questionnaire

The results show that the subtitled information the participants were exposed to were more helpful than no subtitles. Also, the data show a clearer result for the moderate hearing group. This does not suggest that the moderate hearing group had more correct answers than the minimal hearing loss group, but rather that the former group had few right answers on the no subtitles condition, and therefore we see that there is a greater difference between the subtitles conditions and the no subtitle conditions. This indicates that for learners who suffers from a more serious condition of hearing loss, subtitles would be more helpful. The minimal hearing loss group were able to comprehend more from the no subtitle condition because of the fact that they suffer from minimal hearing loss and were more likely able to hear what was being said and discussed in the no subtitle clip.

There is also a significant difference for the minimal hearing loss group on English subtitles over Norwegian subtitles. It is debated in the ESL classroom what language the subtitles should be shown in, the target language or the native language, in order to facilitate learning. Viewing films subtitled in Norwegian will for some might make it easier to comprehend the information (see comments from participants). However, it is widely accepted that the target language should be used as much as possible in language classes in order to maximize exposure to comprehensible input. Mitterer and McQueen (2009) also found in their study that the target language subtitles are more beneficial.

As the results show that English subtitles were beneficial I argue that because the questions in the questionnaire were all asked in English, this might have something to do with the fact that English subtitles were more beneficial even though some of the participants answered that they felt it was easiest to follow the plot with Norwegian subtitles. The facilitative effect of subtitles is in line with the argument made by Mayer (2014) who argues with what he calls the multimedia principle: “people learn more deeply from words and pictures, than words alone” (p.43), and also Paivo’s (1971) Dual -Coding theory. The two main channels that we use to process information, the auditory and visual channel, lead to better recall and greater depth of processing when they interact – which would explain why L2 learning and comprehension can be enhanced by combining images with verbal information (Sydorenko, 2010). Also Baltova (1994) reported positive effects of visual clues from videos, and found that learners who has access to audio and video almost doubled the comprehension scores of the audio-only group that he was studying. Therefore, to facilitate an including learning environment, educators can make use of films and include subtitles as the presence of sound and video can be argued to make information easier to comprehend for hard of hearing learners.

Improving the understanding of comprehension is one of the most difficult challenges regardless of whether one suffers from a hearing loss or not, especially when they find themselves in an environment where they are not regularly exposed to the target language (Ellis, 2013). An important factor in order to develop second language proficiency is to increase the amount of L2 exposure (Pujadas and Munoz, 2020). As discussed in the input-chapter of this paper, authentic input is of great importance in SLA. One way to increase L2 exposure while being exposed to authentic input is through extensive viewing, for example by viewing TV-shows. Vulchanova et al. (2015) argues that TV-programs is an effective source to comprehensible input. Furthermore, it has the additional semantic support provided by the images (Rodgers, 2013). Also, compared to other sources of comprehensible input such as reading, TV can provide a large amount of input in a short time (Pujadas and Munoz, 2020). Because of difficulties of having a hearing loss, for example, the addition of on-screen text in the L2 or the L1 can make this input comprehensible (Danan, 2004).

Previous research examining comprehension of audiovisual material input has consistently shown the positive effects of captioning over non-captioning for viewing comprehension (Gass, et al., 2019; Montero-Perez et al., 2013, 2014; Rodgers and Webb, 2017). Some may think that the appearance of subtitles would make the viewing session more difficult as there

is more to focus on at the same time, see the images while reading at the same time. However, Danan (2004) and d'Ydewalle and Gielen (1992) found that aural and verbal textual information are processed in parallel, meaning that reading the captions would not hinder the processing of the material that is viewed. Subtitles seem to be more effective for content comprehension (Bianchi and Ciabattini, 2008; Markham et al., 2001), and this study implies that the textual information provided in the subtitles aided the overall comprehension and understanding of the plot.

9.2 The vocabulary and word definition task

As with the comprehension data, one can see that the clearest difference is definitely between English subtitles and no subtitles for the moderate hearing loss group. I believe that the same reason goes for this task as for the comprehension task. The descriptive statistics indicate that the choice of subtitles does predict the outcome of the score in this test. However, the clearest results are still found for the comprehension task. It is difficult to say whether learning of new words happened with subtitles, and one can argue that word learning needs more time and exposure. The participants' English vocabulary might have been activated during the process, but still we do not know what was known before taking the test, and what eventually was a learning outcome. The descriptive statistics suggest that stimuli type does have a noticeable effect on the accuracy of the answers in the word-definition task.

Webb and Rodgers (2009) pointed out that “reaching the target vocabulary size may be too difficult a task for many learners and movies should probably not be used without providing some learning support” (Webb and Rodgers, 2009, p.420). Pre-teaching vocabulary that the learners will encounter in the input seems to provide them with enhanced learning opportunities. Working with words and phrases that are relevant to a movie used in educational settings is something many educators are advised to do as a pre-watching activity (Harmer, 2007), and that is a great tool if the students are supposed to focus on any words and phrases in particular. If the goal of a SLA lesson is to optimize the effectiveness of vocabulary learning through TV-programmes, Pujadas and Munoz (2020) argues that one can do this by involve intentional or explicit learning. Research in the area of extensive reading suggests that learning rates can be increased by deliberately focusing attention on vocabulary (Elley, 1989; Hulstijn, 2013). However, Rodgers (2013) argues that vocabulary acquisition happens incidentally through audiovisual input, and that learning occurs as a by-product of the activity. Indeed, a growing number of studies in this area consistently suggest that

incidental vocabulary acquisition does occur through viewing short clips, full movies, and TV-series (Pujadas and Munoz, 2020).

Neuman and Koskinen (1992) argues that a minimum competency threshold might be necessary in order to benefit from captioning in L2 learning. The participants in this study reported that they all were on the same level, ranging from conversational to fluent. Also, they were over 18 years old, which means that they would have been exposed to English at least from when they started mandatory English education in elementary school. The input they were exposed to would therefore be relatively easy to understand, hence the minimal variation in the results from the vocabulary questions. Furthermore, the participants were not asked for something special in particular, they were only told that they would answer questions that had something to do with what they saw. I therefore suggest that it was easier for them to comprehend the general plot, than to focus on only a few words per clip. If I had told them to focus on the plot and some of the words while watching, this would lead to cognitive overload. Pujadas and Munoz (2020) argues that cognitive overload happens learners' cognitive processing exceeds the available cognitive capacity (p. 6). This claim is supported by VanPatten (2002) who states that "learners can do only so much in their working memory before attentional resources are depleted and working memory is forced to dump information to make room for more (incoming) information" (p.757).

Pujadas and Munoz (2019) studied L2 vocabulary learning and to what extent it could be learned through extend exposure to TV-series. The participants consisted of 106 secondary school learners from Barcelona. One group were pre-taught the vocabulary, and were watching the series with captions, and another group were not pre-taught the words and watched the series with subtitles. What they first found was that participants did learn L2 vocabulary from extensive exposure to audiovisual input. Second, they found that groups that were pre-taught words before the viewing session performed better than groups who did not receive such attention. What this study shows is the importance of instructed vocabulary teaching, and that intentional learning is significantly more efficient than incidental learning (Hulstijn, 2003). Even though subtitles have shown to be beneficial in language comprehension and general understanding, the question to what extent it is beneficial for vocabulary learning remains a bit unclear in this study. The general consensus in this area is that captions provide more exposure to the target language, thus being more beneficial for language learning and vocabulary acquisition (Danan, 2004; Vanderplank, 2010).

9.3 Comments from participants

As explained in the method chapter I chose to add space for a comment in my online survey. I asked the participants at the end of the survey to write a few sentences on their experience and beliefs concerning subtitles as a tool for language learning. I will discuss the statements that I thought were interesting:

Participant 1: *“Merket jeg matte konsentrere meg litt mer uten undertekster (...) Jeg tenker at engelske undertekster i språkopplæring i engelsk kan være et veldig nyttig redskap (...) Nordmenn er såpass vant til undertekster at de ikke vil ‘komme i veien’».*

Participant 2: *«Jeg merket stor forskjell på hva jeg fikk med meg og ikke på de ulike klippene, det var hardt å konsentrere seg såpass mye på det siste klippet».*

The two participants claim that the condition without subtitles made them have to concentrate more, and that English subtitles could be beneficial in second language learning. Furthermore, the first participant states that Norwegians are used to subtitles so that it is not something that ‘gets in the way’.

First, I find it interesting that the participants found it easier to concentrate when there were subtitles, and these comments are supported by what other researchers have found on the social and academic difficulties, and overall well-being amongst hearing impaired learners (Kermit, 2018; Goldberg and Richburg, 2004). Hard of hearing students are at risk of learning a language that is distorted or degraded, and often they rely on visual cues such as lip reading. The effort to process and make sense of auditory information is called cognitive load. The brain is simply preoccupied with filling in the blanks, leaving little energy to store and process what has been heard into working memory (Sweller, 2011; Pujadas and Munoz, 2020; VanPatten, 2002). A study by Hornsby et al. (2014) sought to examine the effect of hearing loss on subjective reports of fatigue in school-age children. They found that children with hearing loss reported significantly more fatigue than children with normal hearing. Even though people with a hearing loss are able to fully acquire a second language, the preliminary data on fatigue amongst hard of hearing children are important given the negative academic and psychosocial consequences associated with fatigue (Hornsby et al., 2014, p. 1). If it is reported that subtitles can help student comprehend the information from film clips, as I claim

it does with the statement from participant 1, then that is a tool that should be familiar to any educator.

Participant 3: *“Det hjalp godt med undertekst, både norsk og engelsk. Handlingen kom nærmest med norsk undertekst, men det opplevdes mest interessant med engelsk undertekst».*

Participant 4: *«Jeg tror jeg fikk mest ut av innholdet når teksten var norsk, men om man skal lære engelsk, vil det være nyttig med engelsk tekst. Slik kan man både se og høre, og kanskje forstå ord og uttrykk ut fra konteksten».*

Participant 3 and 4 reported that subtitles were beneficial, and that they felt relatively closer to the plot with the subtitles on the native language, but that with English subtitles the experience became more interesting. The fact that it is easiest to understand the plot when it is presented with native language subtitles is in my opinion natural. This is also something that the educator need to keep in mind when using films in education, that it might be difficult for learners with low proficiency in English to keep up with the plot if it is presented with second language subtitles. Using subtitles as a tool in facilitating language learning is not straightforward, and participant 5 states something important regarding this *“undertekster er ikke et nødvendig redskap i språkopplæring, men det er et sterkt hjelpemiddel hvis det er brukt riktig”*. The participant states that it is not a necessary tool, as an educator you should not rely on subtitles as a language learning tool only even though there are several benefits to it. However, as the participant argues, it can be a great tool if used correctly.

The results of this study suggest that the potential effect of subtitles was only significant in the comprehension questionnaire and within the moderate hearing loss group. It was a significant difference whether the participants had been exposed to subtitles or not. However, the results showed that both the Norwegian and English subtitles were beneficial. The participants benefitted from the combination of auditory, the verbal visual, and the non-verbal visual channel in the input-material, with the subtitles thus enhancing comprehension. The majority of studies on comprehension shows that subtitles in the viewers native language facilitate understanding of the content better than captions (Bianchi and Ciabottini, 2008; Birulés-Muntané and Soto-Faraco, 2016; Latifi et al., 2011), which is not surprising because reading the text in your native language logically facilitates understanding. This is also true for this study. Also, the participants in this study found it easier to read than to listen because of their hearing loss, and therefore they benefit from seeing content in their native language.

We can say that the English subtitles worked better than no subtitles, and that it is important for the students to be exposed to the target language as much as possible. So therefore, the best possible subtitle scenario overall is subtitles in the target language. Additionally, audiovisual material is proven to be a great source of exposure to authentic input in the target language, and has the potential to enhance second language acquisition. Subtitles in general make the input more comprehensible, however, in this study intralingual subtitles proved to be more beneficial for L2 comprehension. Finally, based on the participants' comments, subtitles seem to be a tool that lessens their cognitive overload of concentration as they use the subtitles as a support for what they could not hear, and rather read the plot in order to being able to understand the plot.

10.0 Conclusion

This study has made several contributions to the area of hard of hearingness and second language comprehension, and also on researching the benefits of watching captioned audiovisual material in L2 learning. First, results confirm previous findings regarding the potential of TV-programmes for language comprehension and as a rich source of comprehensible input. Secondly, this study has proven that people who suffers from a minimal-to-moderate hearing loss will benefit from being provided with captions as a visual cue when watching films in the ESL classroom. Although deficiency can be improved with technical aids, such as hearing aids, it is important to keep in mind that one can never focus on only one sound using hearing aids; one can never turn off background noise. It does not have the same effect on the reception of the language and its coding. Third, audiovisual material has proven to be a great tool for language learning as it is suggested that people learn more deeply from the combination of pictures, words, and sound because all these inputs activates both the auditory and the visual channel (Mayer, 2014; Paivo, 1979). The school has a very important role in how first and second languages are taught, and educators are in charge for students with hearing loss and to help them develop languages efficiently, and therefore to carry out strategies of inclusion in the classroom that benefit every student.

I found that subtitles aided comprehension of plot, which was tested immediately after the screening. Subtitles were found to enhance the performance of the participants with moderate hearing loss. Subtitles do affect learning, and the learners that benefit most from subtitles are the ones who have a moderate hearing loss. The best case for learning vocabulary, however, seems not to be via by viewing TV-programmes with subtitles only, it needs more work. However, vocabulary learning might function as a bi-product of watching programmes with subtitles for hard of hearing learners. It is of my opinion that the findings in this study can be transferred to several classrooms, and that it is not only helpful for learning how to treat audiovisual material, but it also provides a thorough insight in how hearing loss affects peoples' well-being and behavior. Lip reading, for example, requires intense concentration and is tiring over long periods. It is also a technique that is widely used amongst hard of hearing learners. Depending on techniques that earlier have been regarded as crucial for hard of hearing learners (Goldberg and Richburg, 2004) results in cognitive overload and will potentially lead to learner anxiety (Pujadas and Munoz, 2020, Sweller, 2011, VanPatten,

2002). I suggest using assistive technologies such as captioned films or documentaries as a tool in the ESL classroom to assist students with mild-to-moderate hearing loss to lessen their load of extra concentration. To get the most out of the viewing it will be beneficial to pre-teach relevant words and phrases that the learners will be exposed to during the viewing. Subtitles allows students with a hearing loss to see what is taught in the form of video, and also the subtitle feature makes the video more accessible to people who cannot follow along with the audio.

It is important to obtain information on management benefits for people with a mild-to-moderate hearing loss, and the only way to do it is through research. Intervention for hearing impaired students can be broken down into one main area: The need for educational support must be considered. This means that teachers must learn about the condition and how to facilitate for an inclusive learning environment. The need for further investigation on mild-to-moderate hearing impairment is crucial and the area certainly deserves further investigation.

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Appendices

Appendix 1. Consent form

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet *masteroppgave*, og har fått anledning til å stille spørsmål. Jeg samtykker til:

- å delta i *spørreundersøkelse*
- at mine personopplysninger behandles utenfor EU – hvis aktuelt*
- at opplysninger om meg publiseres slik at jeg kan gjenkjennes– hvis aktuelt*
- at mine personopplysninger lagres etter prosjektslutt– hvis aktuelt*

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, 15.mai 2020

Appendix 2. Background information

Name: _____

Age: _____

Degree of Hearing

Mild hearing loss: 26-40 dB _____

Moderate loss: 41-55 dB _____

Part B: Language background

Rate your level of English using these terms:

Basic – you can communicate on simple topics or know some phrases in this language.

Conversational – you can communicate on everyday topics with minor grammar or vocabulary mistakes but you can't write in this language.

Fluent – you have the ability to express any idea without hesitation, with good vocabulary and grammar; people understand you easily. Both your spoken and written skills are good.

Proficient – different from fluent in the way that you now understand the structure of the language and you can explain how this language works to other people. You also can use idiomatic language and understand local accents

Appendix 3. Questions

Part 1. With Norwegian subtitles

Comprehension task

1. Where does Felix come from?
 - a) North-Germany
 - b) South-Germany x
 - c) East-Germany
 - d) I do not know

2. What did Felix make on his bike trip?
 - a. A documentary x
 - b. New friends and family
 - c. A new album
 - d. I do not know

3. Why did they have to be at the Canadian border so soon?
 - a. Their visa was running out x
 - b. Their dog did not enjoy to travel in the bus
 - c. They wanted to see and experience as much as possible
 - d. I do not know

Vocabulary/word definition task

1. “We were never really passionate about cycling, so we needed a new...”
 - a. Way of transportation
 - b. Mean of transportation x
 - c. Transportation unit
 - d. I do not know

2. “Less planning, more...”
 - a. Credibility
 - b. Anxiety
 - c. Flexibility x
 - d. I do not know

3. “Repulsion” means?
 - a. To reconstruct something
 - b. To get the feeling of wanting to travel
 - c. To feel disgust
 - d. I do not know

Part 2. With English subtitles

Comprehension task

1. Where did the travelers meet the Canadian couple?
 - a. Banff
 - b. Lac des Mille Lacs x
 - c. Alaska, at the border
 - d. I do not know
2. What is the hole in the floor in the truck for?
 - a. It is used for fishing on the ice x
 - b. It is used as a toilet
 - c. It is used for hunting
 - d. I do not know
3. What do they love about Banff?
 - a. Cooking meals in their bus
 - b. The people that live there
 - c. Going on walks with their dog Rudi, returning to their cozy home and the breathtaking nature x
 - d. I do not know

Vocabulary task

Fill in the correct word

1. “And it’s exciting too, because we never know what... us”
 - a. Awaits x
 - b. Waits for
 - c. Nears
 - d. I do not know
2. “No... just living the life, live in the moment”
 - a. Apartments
 - b. Appointments x
 - c. Expectations
 - d. I do not know
3. What does Felix mean when he says the nature is “breathtaking” ?
 - a. Extremely beautiful x
 - b. There is little air up in the mountains
 - c. It is okay
 - d. I do not know

Part 3. Without subtitles

Comprehension task

1. What do they think is most challenging about travelling
 - a. The roads are bad
 - b. That their visa is about to run out
 - c. Not understanding what the people were saying
 - d. I do not know

2. What does Felix feel about driving through Denali national park?
 - a. Scary, as the bus was about to break down
 - b. That it was the best ride of his life
 - c. It was extremely challenging due to the roads
 - d. I do not know

3. Why do they celebrate with a dance?
 - a. They had been driving 10.000 kilometres
 - b. Their visa became valid
 - c. They were cherishing the breathtaking nature
 - d. I do not know

Vocabulary task

Fill in the blank space with the correct word

1. We are five miles away from the... to Alaska
 - a. Bridge
 - b. Boundary
 - c. Border
 - d. I do not know

2. "Usually it's all ..."
 - a. Sold out
 - b. Full
 - c. Booked out
 - d. I do not know

3. "The road was all ... and bumpy roads"
 - a. Gravel
 - b. Sandy
 - c. Grifted
 - d. I do not now
 - a. I do not know

Appendix 4. Table 1. Shapiro-Wilk test

TABLE 1. Descriptive statistics from analysis based on score

Condition	Mean	SD	Shapiro-Wilk test
<i>Norwegian subtitles comprehension</i>	2.07	0.730046	p= 0.00936921
<i>Norwegian subtitles vocabulary</i>	2.42	0.646206	p= 0.00159208
<i>English subtitles comprehension</i>	2.85	0.363137	p= 0.00000170776
<i>English subtitles vocabulary</i>	2.64	0.497245	p=0.0000565034
<i>No subtitles comprehension</i>	1.5	1.019049	p=0.0515890
<i>No subtitles vocabulary</i>	1.7	0.611250	p=0.00209680

Appendix 5. Table 2. Wilcoxon test

TABLE 2. Wilcoxon test

Variable tested	Level of hearing	Conditions compared	Z	p=		
Comprehension	Minimal	English subtitles & Norwegian subtitles	-2.000	0.046		
		English subtitles & No subtitles	-1.730	0.084		
		Norwegian subtitles & No subtitles	-0.552	0.58		
		Moderate	English subtitles & Norwegian subtitles	-2.333	0.020	
	Moderate	English subtitles & No subtitles	-2.232	0.026		
		Norwegian subtitles & No subtitles	-2.121	0.034		
		Vocabulary	Minimal	English subtitles & Norwegian subtitles	-1.000	0.31
				English subtitles & No subtitles	-2.121	0.034
Norwegian subtitles & No subtitles	-2.000			0.046		
Moderate	English subtitles & Norwegian subtitles			-.577	0.564	
Moderate	English subtitles & No subtitles		-2.121	0.034		
	Norwegian subtitles & No subtitles		-1.890	0.059		

