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The role of English as L2 in the acquisition of L3 Norwegian by Italian native speakers

Cross-linguistic Influence in adult multilingualism

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Master's thesis in English Linguistics, ENG-3991, May 2023

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Acknowledgments

First and foremost, I would like to express my gratitude to my supervisors, Fatih Bayram and Brechje van Osch, for all their support and guidance. I am deeply grateful for your valuable comments and meticulous assistance through every step of this thesis, especially in the conceptualization and refinement of the experimental design and the statistical analysis.

Similarly, I am deeply grateful to all the participants of the pilot study and the main experiment for contributing to this thesis and those who helped me with the recruitment process. This thesis would not have existed without your involvement. I extend my special thanks to all the Norwegian speakers who proofread the experimental items and gave me valuable feedback.

I want to express my heartfelt gratitude to those who shared this journey with me, especially Jagoda and Cynthia, who made my days brighter and struggles lighter, as well as my other international friends and colleagues.

Last, I express my heartfelt gratitude to my partner, Filippo, for believing in me the whole time and for his endless support. Similarly, I want to thank my family for their support and for making this journey possible. You made me the person I am today, and your continuous encouragement throughout my years of study made it easy to bear the distance.

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ADV-V	Adverb-Verb word order
AOA	Age of Acquisition
CEFR	Common European Framework for Reference for Languages
CEM	Cumulative Enhancement Model
CLI	Cross-linguistic influence
DEF	Definite
DET	Determiner
DN	Double Negation
ENG	English
F	Feminine
FUT	Future
GJCT	Grammaticality Judgment and Correction Task
GJT	Grammaticality Judgment Task
ITA	Italian
L1	First language/ Native language
L2	Second language
L2A	Second language acquisition
L3	Third language
L3A	Third language acquisition
LHQ	Language History Questionnaire
Ln	Languages acquired after L3
LPM	Linguistic Proximity Model
M	Masculine
N	Neuter
NOR	Norwegian
POSS	Possessive
RQ	Research question
RT	Reaction Time
SD	Standard deviation
SLA	Second language acquisition
SPR	Self-paced reading
SVAO	Subject-Verb-Adv-Object word order
SVO	Subject-Verb-Object word order
TPM	Typological Primacy Model
V-ADV	Verb-Adverb word order

1 Introduction

As multilingualism becomes the norm (Grosjean, 2013; Flynn et al., 2004) and as the field of third language (L3) acquisition grows, the central question remains whether one or more languages influence the acquisition of the target one(s).

The aim of the present study is to contribute to the ongoing debate in L3 study regarding the source of crosslinguistic influence (CLI) by investigating the role of English as a second language (L2) in first language (L1) Italian speakers learning L3 Norwegian. As noted by O'Brien et al. (2018), English is the most commonly taught L2 in Italy and is introduced as a subject from the age of six. Crucially, English is one of the most commonly taught languages worldwide, and there are numerous countries where it is widely studied as a second or foreign language. For instance, in secondary educational institutions across Europe, English is the most frequently taught second language (Eurostat, 2020). As for now, "English is the most widespread medium of information exchange the world has ever known", and "at no previous time in history has a third of humanity shared a language nor have we had the technology to pool knowledge in a manner independent of geographic constraints" (EF Education First, 2022:27). Hence, it is of utmost significance to discern the potential effects of this *lingua franca* on the acquisition of (a) subsequent language(s).

The effect of, not only the L1, but also the L2 on L3 acquisition is a crucial topic in the field of language acquisition, as "while questions of transfer processes in L2 address transfer from the L1, the acquisition of a third language introduces a number of new variables" (Dahl et al., 2022:192).

In recent years, there has been an increase in experimental studies on the topic of L3 acquisition. However, despite this progress, there are still inconsistencies in the field, and the source of CLI remains a topic of debate. In other words, "the question is no longer limited to the extent to which the system of the L1 is transferred into the new language, but also which of the previously acquired language system(s), L1 and/or L2, may transfer" (Dahl et al., 2022:192). To address these inquiries, several models have been proposed and, broadly speaking, they can be categorized into two types: those that propose transfer from only one of the two previously acquired languages (wholesale), and those that allow for transfer from both the first and second language (property-by-property).

The models that propose wholesale transfer include the L1 Factor (Hermas, 2010, 2014), the L2 Status Factor (Bardel & Falk, 2007; Falk & Bardel, 2011), and the Typological Primacy Model (Rothman, 2011, 2013, 2015). In contrast, the Cumulative Enhancement Model (Flynn et al., 2004) and the Linguistic Proximity Model (Westergaard et al., 2017) belong to the property-by-property group.

Building up from previous research in the field of third language acquisition, this study aims to address and answer the following research questions, focusing on the impact of English in the acquisition of L3 Norwegian by L1 Italian speakers.

The first aim is to examine whether there is evidence of transfer from L2 English to L3 Norwegian and to investigate the nature of this transfer. Specifically, it seeks to determine whether the transfer is primarily facilitative, non-facilitative, or a combination of both. Furthermore, the study aims to explore the role of extra-linguistic variables, such as proficiency level, exposure to English, and frequency of English language use, in modulating the degree of transfer from L2 English to L3 Norwegian.

In order to address these inquiries, this investigation incorporates an experimental component that considers the acquisition of four syntactic linguistic features, specifically: (i) possessives gender agreement, adverb placement in main (ii) and subordinate (iii) clauses, and (iv) topicalized sentences word order. Participants are L1 Italian-L2 English students of Norwegian as their L3, recruited among Italian universities and language courses. The participants answered a language history questionnaire (LHQ), and then completed an online self-paced reading (SPR) task, before being evaluated for their language proficiency in L2 and L3.

What emerged from the experiment is that participants did not show sensitivity to grammatical deviations in the possessive and topicalized structures, potentially due to CLI from English. Influence from their L2 English resulted in non-target-like behavior in the processing of adverbial phrases, both in main and subordinate conditions. Indeed, participants slowed their reading times in the occurrence of a correct word order, which, due to the design of the experiment, can only be attributed to influence from English. Moreover, what emerged from the analysis is that this behavior was significantly correlated with length of English instruction. Other extra linguistic variables, such as proficiency and exposure, did not significantly correlate with their ability to discern, or not, grammatical violations in the task.

This thesis is structured as follows: Chapter 2 introduces the theoretical background upon which this study is based. This includes addressing some terminological ambiguities in the field of language acquisition, models of third language acquisition (L3A), and empirical evidence for CLI effects in L3A from previous studies. Additionally, the specific linguistic characteristics of Italian, English, and Norwegian are described in relation to their use in the experiment. Chapter 3 focuses on the scope and research questions of the present study, as well as the hypotheses. Chapter 4 describes the experimental methodology, including information regarding the participants. Moving forward, Chapters 5 and 6 present the results and data analyses, which are subsequently discussed in the following Chapter 7. In the same section, the limitations of the study and some insights for future research are discussed. Finally, Chapter 8 offers the study's conclusion.

2 Theoretical background

This section offers a detailed account for a number of key definitions and concepts in the field of third language acquisition (L3A).

To start with, a number of main themes such as cross-linguistic influence (CLI) and L3A are introduced and discussed in subsections 2.1 and 2.2, followed by a brief summary of influential CLI models in L3A. Subsequently, the properties under investigation in this research are presented in subsection 2.3, while section 2.4 aims at reporting the findings of previous studies.

2.1 Terminological ambiguities

As the field of L3A is relatively new, it is still accompanied by the uncertainty of the most appropriate terminology to use (De Angelis, 2017). For this reason, this sub-section serves to provide a summary of some terminological problems. Moreover, it serves to give an account of the various proposals that the scholars have embraced or rejected to deal with them.

2.1.1 Cross-linguistic influence and transfer

The term *cross-linguistic influence* (CLI) refers to the influence of a learner's prior knowledge of a language(s) on the acquisition of a new one.

As a key concept in second language acquisition (SLA), CLI is used as a synonymous term for both *language transfer* and *interference* (Odlin, 2013). However, it is necessary to distinguish the various nuances of these terms.

The word *transfer* is used to refer to a systematic and consistent pattern of errors that occur in bilingual language production (either oral or written). As in Richards & Schmidt (2013:322), it can either be positive or negative. Positive transfer occurs when knowledge of a certain language facilitates learning and improves performance in the new language. Negative transfer, on the other hand, occurs when the features of the previously acquired language(s) interfere with the acquisition of the new one, leading to errors or difficulties in learning.

The term crosslinguistic influence, on the other hand, can be used as a term that includes "both representational (transfer) and nonrepresentational influence that manifests as in the moment bleeding over from another language at the level of performance/production" (Rothman et al., 2019). In other words, crosslinguistic influence is a phenomenon that occurs

at all linguistic levels when bi-/multilingual speakers transfer knowledge from one language to another one.

Even if the term transfer has recently been considered “unhandy” and “misleading” (Sharwood Smith, 2021), it still represents a well-known terminology to describe the “effect of one language on the learning of another” (Richards & Schmidt, 2010). For this reason, and despite such limitations, the terms *transfer* and *CLI* will be used as synonyms throughout this investigation to refer to the influence features of one language may have on the features of another.

2.1.2 Bilingualism/multilingualism

By most people, a *multilingual* person is understood as an individual who is familiar with multiple languages (Rothman et al., 2019). On the other hand, a *bilingual* is considered someone who is familiar with *two* languages (De Angelis, 2017).

However, the situation is more complex than this. The term bilingualism itself is quite complex to define, and it is probably for that reason that researchers have not found an unambiguous definition for it yet. For some, being bilingual means being able to communicate in “more than one language” (Grosjean, 1989; Bialystok, 2001), which goes in the same direction of Oksaar’s definition: “two or more languages" (1983:19). For others, it means knowing only two languages, in a sort of binary definition (Valdez & Figueroa, 1994, cited by Gottardo and Grant, 2008). As it is stated in Oxford’s dictionary, a bilingual is “a person who can speak two languages equally well”.

But what does it mean to know a language? People can have different levels of proficiency in one or more languages and still be defined as bilinguals. Some bilinguals may have a great level of proficiency in all the languages they speak, while most of them have a dominant language. A bilingual person that has the same level of proficiency in both (or more) languages they speak is usually referred to as a “true bilingual” (Thiery, 1976, cited by Cutler et al., 1992). However, true bilinguals are the exception because “it is highly unlikely that a speaker who uses two languages will use each in exactly the same way” (Cutler et al., 1992). Moreover, bilingualism is a dynamic state that evolves with the person, which means that language proficiency can vary during different stages of life. In general, it is possible to

distinguish bilinguals by the age of language acquisition (AoA), and different criteria have been proposed to distinguish people that learn languages at their early ages from adults (Genesee & Nicoladis, 2008).

As is noted by Hoffmann (2001:2), the term multilingualism is often used in place of bilingualism because it "encompasses the idea that not only is more than one language involved, but also that any number of linguistic varieties may be present in the particular sociolinguistic situation under consideration".

On the other hand, even if sharing features with the terms bilingualism and multilingualism, the term trilingual/trilingualism has characteristics of its own and refers to the idea that the number of languages involved is "clearly specified" (De Angelis, 2017:2).

Moreover, what is the correct definition of trilingual? And can a trilingual be also referred to as a multilingual? Following a straightforward definition based on the number of languages known by the speaker, a multilingual is normally defined as a person familiar with three or more languages (De Angelis, 2007). In this case, the two definitions seem to overlap, and even the term bilingual seems to belong to the same group, as it can refer to "anything beyond the L1" (De Angelis, 2007:9).

To avoid any further complications, the term third language acquisition (L3A) will be used to describe the acquisition of "all languages beyond the L2 without giving any preference to any particular language" (De Angelis, 2007:11). Their native language will be described as their L1, while the subsequent acquisition of English, more or less between the ages of 6-10, is identified as their L2. Moreover, both multilingual and trilingual terminology will be adopted to refer to their linguistic experience, as they are familiar with at least two languages. Indeed, this study incorporates participants who exhibit a certain degree of competence in more than two or three languages, which is attributable to the structural design of the Italian compulsory education system.

2.2 Third Language Acquisition

The field of third language acquisition (L3A) is relatively new and a considerable amount of research is still needed to "unconfound certain factors left confounded in

L1/L2 acquisition" (Flynn et al., 2004:4), such as the role of the L1 in subsequent language learning (Flynn et al., 2004).

Importantly, non-native language learners have "one or more linguistic systems in their minds when they are exposed to a new language" (Jensen, 2022:12) and whether they make use of both, and how, is still not clear (Jensen, 2022).

As the field of L3A started growing, consequently, new questions began to emerge, such as "how does transfer unfold when the mind has choices at its disposal?" (Rothman et al., 2019:188). As in Rothman et al. (2019):

> "With increased sources from which to choose, determining what variables, if any, condition how previous linguistic knowledge affects the L3/Ln process makes the challenge of investigating this more exciting than it is in L2 acquisition in some ways." (Rothman et al., 2019:188)

Finding a definitive solution to these questions is beyond the scope of this investigation. For this reason, this section is limited to presenting theories and studies to provide a broader view of the subject.

2.2.1 Definition of L3A

There is an ongoing debate among researchers about the nature of L3 acquisition and how it differs from second language acquisition (L2). Indeed, it is safe enough to recognize L1 as the main source of transfer in L2A (Schwartz & Sprouse, 1996) because second language learners can only transfer from their native language, as they have "no choice" (Rothman & Cabrelli Amaro, 2009:2).

In L3/Ln acquisition, the situation is different, as "there are at least two potential sources of transfer" (González Alonso et al., 2021). In other words, the learner has the availability of more than one system of linguistic representation (Puig-Mayenco et al., 2020), and can therefore get crosslinguistic influence from more than one language.

According to some scholars, such as Slabakova and García Mayo (2016), L3 acquisition involves learning languages successively after acquiring a second language. In other words, L3 is seen as a distinct stage of language acquisition that occurs after L2, and the languages learned at this stage are all subsequent to the second language (L3 = Ln). For others, the L3 is considered as the language being acquired by individuals

who have previously acquired other two languages, therefore L3 ≠ Ln (Perić & Novak Mijić, 2017).

2.2.2 Models for L3A

Having to deal with such a complex framework, through the years scholars proposed several models to explain L3 acquisition, and they can be divided into two large groups: some argue that it is only one of the previously acquired languages that influence the third one, while others argue that the target language receives influence from both acquired languages. In this section, the models and their predictions are briefly presented. The theories that form the foundation for the development of these models are discussed in this section. The studies supporting these theories and their findings, on the other hand, are presented in section 2.4.

At the moment, there is no conclusive answer to determining whether it is the first or the second language that plays a dominant role in the acquisition process (Lindegaard Helms, 2019). Indeed, there remains a lack of consensus among existing models and theories regarding the acquisition of an L3 (Rothman et al., 2019). Models have emerged at different times, and some of them did not receive the same amount of support from the published literature (Rothman et al., 2019). However, all models exhibit a common aim of addressing a fundamental inquiry:

> "In the case someone learns an additional language after having acquired at least two before, research shows that we cannot take for granted that transfer will always come from an easily predictable source as in L2 acquisition." (Puig-Mayenco & Rothman, 2020; in Puig-Mayenco et al., 2022).

If both previously acquired languages are the source of transfer, then is transfer wholesale or property-by-property?

2.2.3 Wholesale transfer models

Wholesale transfer models predict the entire transfer of one of the previously acquired languages into the L3, whereas the non-transferred language stays neutral (Ben Abbes, 2020).

Among the models that account for wholesale transfer, there are: the L1 Factor (Hermas 2014), the L2 Status Factor (Bardel & Falk, 2007; Falk & Bardel, 2011), and the Typological Primacy Model or TPM (Rothman, 2010, 2011, 2015).

Several studies propose that transfer is mostly derived from the L1 (Jin 2009; Hermas 2014), which will always be the most influential. According to the same author, the L1 Factor (Hermas, 2014) is not formalized as a model, but it suggests that the L1 is the privileged language to be transmitted in L3A.

On the other hand, there are models like the L2 Status Factor (Bardel & Falk, 2007; Falk & Bardel, 2011), which suggest that the L2 has a key role in the development of the L3 because of the recency and psychological prominence, especially at early stages of acquisition. As described by Rothman (2013:4), "the L2 Status Factor maintains that the L2 takes a significantly stronger role than the L1 in the initial stages of L3 morphosyntactic acquisition". As noted by Paradis (2004, 2009; in Westergaard et al., 2017), this model is supported by experimental evidence suggesting that "implicit linguistic competence and explicit metalinguistic knowledge are neuro linguistically distinct and have different memory sources". In other words, the language learner is aware of the ongoing learning process and is capable of implying various strategies to progress in the process (Bardel & Falk, 2012).

The Typological Primacy Model or TPM (Rothman, 2011, 2015) hypothesizes that L3 development is constrained by structural similarities among the three grammars and that there is wholesale transfer at initial states/initial stages from the typologically closest language. With structural similarities, Rothman (2013:1) refers to "linguistic properties that overlap cross-linguistically at the level of mental representation, whether at the lexical or grammatical levels". Specifically, he predicts that the L3 initial states provide access to both the L1 and the L2. Thus, it is crucial to point out that the TPM only refers to *initial stages* learners and bases its assumptions on experimental data gathered during the first weeks of instruction, and therefore does not make predictions for later stages of L3A (Westergaard et al., 2017).

When speaking of structural similarity, it is hence crucial to mention *linguistic distance*, which is a term that refers to the degree of difference between the languages being learned. According to Kellerman and Sharwood Smith (1986), linguistic distance

is a crucial factor in determining the ease or difficulty of second and third language acquisition. Even more important as a considerable number of researchers agreed that transfer is most likely to occur between languages that are closely related to one another. Kellerman and Sharwood Smith (1986:42) define linguistic distance as "the extent to which two languages differ from each other in terms of their structures, vocabulary, and other aspects that affect language learning". In De Angelis (2007:22), language distance is referred to as the "distance that a linguist can objectively and formally define and identify between languages and language families". Indeed, speakers have been confirmed to borrow more terms from the language that is typologically closer to the target language (Cenoz, 2001). Language learners tend to experience facilitation in acquiring grammatical properties that bear similarity to their previously acquired language L1, in contrast to learners who acquire properties that are dissimilar or absent from their prior language experience (Westergaard et al., 2022). Along the same line, the TPM (Rothman, 2011, 2015) considers *structural similarity* as:

> "Linguistic properties that overlap cross-linguistically at the level of mental representation, whether at the lexical or grammatical levels. Such underlying or true grammatical similarity is assessed and determined subconsciously by the linguistic parses very early in the L3 process based on an implicationally hierarchical continuum of linguistic cues" (Rothman, 2013:2).

Differently from the L1 Factor (Hermas, 2014) and the L2 Status Factors (Bardel & Falk, 2007; Falk & Bardel, 2011), the TPM allows for either the L1 or the L2 to influence the L3.

2.2.4 Partial transfer models

Diversely from the wholesale transfer models, partial transfer models propose that all the previously acquired languages could contribute to the L3A. In particular, Ben Abbes (2020) argues that:

> "Partial transfer models propose that all previously learned languages could contribute to the development of L3 grammar in its early stage of acquisition. That implies that the parser does not necessarily have to transfer the grammatical system of L1 or L2 all at once. Instead, individual grammatical properties of L1 and L2 could be both transferred as needed" (Ben Abbes, 2020:4).

The Cumulative Enhancement Model, or CEM (Flynn et al., 2004), postulates that any previously acquired properties could be a source of transfer for the L3 development. Therefore, any previously acquired language can either enhance subsequent language acquisition or remain neutral (Ben Abbes, 2020). That is because "patterns of acquisition in a new language will depend upon the nature of the linguistics knowledge already represented in the mind/brain of the learner" (Flynn et al., 2004:15).

The Linguistic Proximity Model or LPM (Westergaard et al., 2016; Westergaard, 2019), argues for transfer to happen from all previously acquired languages, and allows, as the TPM, for both facilitative and non-facilitative influence. However, conversely to the TPM, it "advocates facilitative transfer (...) on a property-by-property basis" (Ben Abbes, 2020:44).

In other words, L3A is cumulative. Facilitative influence is based on structural similarity of individual properties, while non-facilitative influence occurs when learners misanalyze L3 input (Westergaard et al, 2016).

Building upon features of both the CEM and the TPM, the Scalpel Model (Slabakova, 2016) argues that "the activated grammatical possibilities of the L1-plus-L2 combined grammar act with a *scalpel-like* precision (...) to extract the enhancing, or facilitative, options of L1 or L2 parameter values" (Slabakova, 2016:5). In other words, L3 learners have access to all previously acquired knowledge, therefore they can get facilitative or detrimental CLI from either or both of the previously acquired languages. The Scalpel Model suggests that if the L3 closely resembles one of the previously acquired languages, that language could be the primary source of transfer. Therefore, CLI takes place on a property-by-property basis (Ben Abbes, 2020).

2.2.5 Extralinguistic factors

Various factors determine the circumstances under which CLI occurs. These factors could predict the degree of CLI on a speaker's production, as well as the source language of the elements that are transferred (Cenoz, 2001). As in De Angelis (2007):

> "Research on multilingualism and CLI has already identified several of the factors that affect learners' reliance on previously learned languages and constrain the type and amount of influence on the target language". (De Angelis, 2007:21)

Among the others, those that are considered to be distinctive of multilingual processes are target and source language proficiency, recency of use, length of residence and exposure to a non-native language environment, order of acquisition, and formality of context (De Angelis, 2007). Owing to the extensive scope of the topic and the spatial and temporal limitations associated with this investigation, it was not possible to comprehensively incorporate all information related to the subject matter in this subsection.

Language dominance "is often seen as relative proficiency in two languages, but it can also be analyzed in terms of language use - that is, how frequently bilinguals use their languages and how these are divided across domains" (Treffers-Daller, 2019:375).

Some scholars (Lloyd-Smith et al., 2018; González Alonso et al., 2021; Puig-Mayenco et al., 2018, 2022) have reported that dominance is not a critical factor in determining the source of transfer, as syntactic transfer can happen from both languages regardless of the overall dominance (Lloyd-Smith et al., 2018) and that dominance cannot outweigh other commonly assumed variables in determining the origin of transfer (Puig-Mayenco et al., 2018). While others (Leopold's, 1939-1949; Argyri & Sorace, 2007; Pavlenko, 2014) reported that the performance on tasks is impacted by the level of bilingual's proficiency and the relative strength of each language (Treffers-Daller, 2019).

In brief, only a few studies have included it as a determining factor, and their findings have yielded inconclusive or conflicting results (González Alonso et al., 2021; Puig-Mayenco et al., 2022).

To address the ambiguous findings including language dominance as a factor, the present study exclusively focused its investigation on a homogeneous group of participants. Indeed, exclusively individuals who were residing in Italy and possessed an Italian language dominance were eligible to partake in the experiment. In order to do so, the inclusion of the language history questionnaire (LHQ, Li et al., 2006) was deemed necessary. The LHQ is a tool comprising a series of inquiries specifically designed to collect information pertaining to the language background of the participants (please refer to section 4.2 for further details).

Nevertheless, language dominance is intricately connected to language usage and exposure, thereby necessitating a thorough examination of these variables in relation to both English and Italian languages. Indeed, the two key dimensions of language dominance are *language proficiency* and *language use* (Treffers-Daller, 2019), the latter defined as "how frequently bilinguals use their languages and how these are divided across domains such as home, work, and school" (Treffers-Daller, 2019:380).

According to Bardel and Falk (2012), a high proficiency level in the L2 language may lead to a decreased reliance on it as a transfer source. In their study, they mention the findings of Abrahamsson and Hyltenstam (2008, 2009; in Bardel and Falk, 2012), and speculate how second language (L2) speakers can develop high proficiency levels by shifting from explicit (metalinguistic) knowledge to implicit linguistic competence through frequent use of the language. This can lead to the automatization of morpho-syntax, resulting in performance that resembles that of native speakers (Paradis, 2009; in Bardel and Falk, 2012). The more experience a learner has with the language, the better their procedural memory becomes, leading to higher proficiency levels (Bardel and Falk, 2012). However, it is rare for the entire L2 grammar to be internalized and subserved by procedural memory (Paradis, 2009; Bardel and Falk, 2012).

Along the same line, Faldet Listhaug et al. (2020) and Dahl et al. (2022), debate that L2 is less eligible for transfer at high proficiency levels. The former being a study on French as an L3 in Norway, and the latter investigating verb placement in German (L3) by L1 Norwegian and L2 English speakers.

Divergent results have only been found by Stadt et al. (2016, 2018, 2020), where they observed that L2 transfer increased with increased L2 input and are therefore acknowledged. Indeed, they found a preferred role for the L2 over the L1 in later stages of L3 development (not initial stages), and argued that, to suppress the L1, the "L2 needs to be sufficiently activated" (Stadt et al., 2020:256). In their previous studies, Stadt et al. (2016; 2018) tested the L2 Status Factor hypotheses (Bardel & Falk, 2007; Falk & Bardel, 2011) but only found partial support for it, concluding that "the smaller amount of L2 exposure the pupils received on a daily basis and throughout the years effected L2 transfer in L3A" Stadt et al., (2020:238).

In brief, most of the findings agree that language transfer is more likely to occur from the L2 to the L3 when the proficiency level in the L2 is not high (Bardel & Falk, 2012; Faldet Listhaug et al., 2021; Dahl et al., 2022). This can be attributed to learners potentially not fully internalizing certain structures, especially as trilinguals inhibit their L1 "more strongly or successfully than their L2" (de Bruin et al., 2023:2, referring to the findings of Tomoschuk et al., 2021). Moreover, an increased L2 input may lead to more L2 transfer into the L3 (Stadt et al., 2020). However, the existing literature on language dominance presents conflicting results, thereby motivating the present study to limit its investigation to a homogeneous group of participants with a dominant language, namely Italian.

2.3 The properties addressed in the study

The following subsections present the four properties addressed in this study, emphasizing the pertinent resemblances and discrepancies in the characteristics among the languages under examination: Italian, English, and Norwegian. Italian belongs to the Romance language family, which is distinct from the Germanic language family to which English and Norwegian belong.

To address potential transfer between the chosen languages combination, the experiment includes (i) nominal possessive constructions, (ii) word order in topicalized constructions, and adverbial placement in declarative (iii) main and (iv) subordinate sentences (Table 1).

In terms of nominal possessive constructions, Italian and Norwegian exhibit similarity by employing gender agreement between the noun and the possessum. Instead, English exhibits noun agreement in gender with the possessor. Regarding topicalized constructions, the word order may vary across languages. Norwegian is a V2 language, while English and Italian are not. Concerning adverbial constructions, Italian and Norwegian license the adverb-verb (Adv-V) word order in main phrases, in contrast to English which favors the V-Adv word order. Conversely, when it comes to subordinate constructions, the Adv-V word order is exclusively permitted in Italian, while English and Norwegian display a preference for the V-Adv word order.

Table 1 - Summary of property distribution by language.

Property	L1 Italian	L2 English	L3 Norwegian
(i) Post-nominal possessive gender agreement with the possessum	√	X	√
(ii) V2 in topicalized structures	X	X	√
(iii) Adv-V word order (main phrase)	√	X	√
(iv) Adv-V word order (subordinate phrase)	X	√	√

Note: √: the property is present. X: the property is absent.

The peculiarities of the addressed properties are described in the following section 2.3, which elucidates distinctions and correspondences among the languages under scrutiny.

2.3.1 Possessive agreement

Possessive constructions play a crucial role in establishing both referential and morphosyntactic relationships within a sentence (Lago et al., 2018). Therefore, this subsection presents an overview of possessives' gender agreement in Italian, English, and Norwegian, drawing on the research previously conducted in this field (Lago et al., 2018; Anderssen et al., 2019; Bernstein, 2005; Fábregas et al., 2019; Espindola, 2022).

To start with, Italian and Norwegian are languages that both have natural and grammatical gender, while for English, gender is only assumed semantically. With

regards to possessive constructions, the phenomenon of gender agreement between the pronoun and the possessum is observed in Romance languages, including Italian. In contrast, in English, the pronoun agrees with the possessor. In Norwegian, the situation exhibits some variation depending on the type of pronouns utilized. In the event of local or reflexive pronouns, they agree in gender with the possessum, while non-reflexive pronouns agree with the possessor. A reflexive or local pronoun refers to the subject of the clause in which it is situated, while a non-reflexive or non-local pronoun refers to a noun phrase located in a different clause.

The present investigation restricts its focus to Norwegian reflexive pronouns, both in the scope of the study and in the experimental design.

Italian

In Italian, the most common type of possessive structure, as in Maiden and Robustelli (2000), is the one formed by 'noun phrase + di + noun phrase (possessor)' as in (1):

(1) Un giorno questa casa sarà tutta di mio nipote.
One day this house be-FUT all of my nephew
'One day this house will all be my nephew's'.

(Maiden & Robustelli, 2000:158)

However, the possessive construction utilized in the present study entails the inclusion of possessive pronouns. In Italian, possessive adjectives occur with the article they agree with in gender and number. The possessive adjectives can be both pre-nominal (as in 2) and post-nominal; however, these two forms express slightly different meanings, and post-nominal possessives are restricted to human referents (Cardinaletti & Giusti, 2019) as in (3), or they carry a strong emphatic and/or emotional meaning (Proudfoot & Cardo, 2012), as in (4):

(2) a. La **mia** zia.
the-F my-F aunt
'My aunt.'

(3) La zia **mia**.
the-F aunt my-F
'MY aunt'

(4) Mamma **mia**!
Mother mine-F
'My goodness!'

As in Cardinaletti (1998), Italian pre-nominal and post-nominal possessives are weak and strong, respectively. The strong possessives, as in (3), are used in "emphatic and contrastive contexts" (Cardinaletti & Giusti, 2019:139).

In the occurrence of singular kinship terms, an article-less possessive construction is possible (Cardinaletti & Giusti, 2019), otherwise, possessives are always preceded by the appropriate definite article (Maiden & Robustelli, 2000; Proudfoot & Cardo, 2012). As in the following example (5) the article-less construction is only possible when the nouns referring to relatives (*mamma*, 'mother', *padre*, 'father', *sorella*, 'sister', etc.) are used in the singular form (Maiden & Robustelli, 2000; Proudfoot & Cardo, 2012):

(5) **Mia** zia.
My-F aunt.
'My aunt.'

Nevertheless, a few exceptions are listed hereafter: *babbo*, 'dad', *mamma*, 'mum', *patrigno*, 'stepfather', *matrigna*, 'stepmother', *figlioccio*, 'godson', *figlioccia*, 'goddaughter' (Maiden & Robustelli, 2000:163).

Table 2 - Italian possessives

Person	Masc sing	Fem sing	Masc pl	Fem pl
1st	mio	mia	miei	mie
2nd	tuo	tua	tuoi	tue
3rd	suo	sua	suoi	sue
4th	nostro	nostra	nostri	nostre
5th	vostro	vostra	vostri	vostre
6th	loro	loro	loro	loro

(from Proudfoot & Cardo, 2012:69)

In Italian, the possessive forms do not indicate the gender of the possessor, regardless of whether they are in the singular or plural form (Maiden & Robustelli, 2000). Therefore, a sentence like the one displayed in (6) is ambiguous:

(6) Il suo tetto.
The POSS roof
'His/her/its roof.'

(adapted from Maiden & Robustelli, 2000:161)

Hence some devices are used to avoid ambiguity when the context does not make the identity of the possessor clear (Maiden& Robustelli, 2000). This study intentionally left out certain items from the experimental design with the purpose of mitigating any potential ambiguity that may have arisen had such items been included.

English

The expression of possession in English is diverse (Börjars et al., 2013), with the pre and post-nominal possessives being the most commonly contrasted structures (Börjars et al., 2013; Peters & Westerståhl, 2013). According to Börjars et al. (2013), English has two primary methods of expressing possession: through non-pronominal noun phrases and pronominal elements. The former, also called nominal possessives, uses *s-possessives* (7) and *of-possessives* (8) (Börjars et al., 2013; Vásquez Carranza, 2010):

(7) John**'s** house.
(8) The father **of** the bride.

(Vásquez Carranza, 2010:148)

The *S-possessives*, or 'Saxon genitive', are realized pre-nominally with the *'s* marker, while the *of-possessives* are realized post-nominally with the preposition *of* that combines with the possessum to form a nominal phrase (Vásquez Carranza, 2010).

Possessive adjectives and a possessive form of pronouns are examples of pronominal possessive elements (Barker, 2011). Indeed, the possessives *his/her/its/their* can be analyzed as "genitive forms of the third person pronouns *he/she/it/they* (Huddleston & Pullum, 2002, in Fabricius-Hansen et al., 2017), expressing the same properties of the possessor (Fabricius-Hansen et al., 2017). A more exhaustive overview of English possessives is provided in Table 3:

Table 3 - English possessives

Person	Number	Possessive adjectives	Possessive pronouns
1st		my	mine
2nd	singular	your	yours
3rd			
masc.		his	his
fem.		her	hers
[- human]		its	its
1st		our	ours
2nd	plural	your	yours
3rd		their	theirs

Source: Espindola (2022), based on Fabricius-Hansen et al. (2017:5) and Samad and Arshad (2017:274).

Notably, English is the only gender-less language in this study. Gender is assumed semantically, as it is encoded "either in different lexical items (e.g. *mare/horse*)(suppletion) or in forms like *actor/actress*; *lion/lioness*, where the feminine form can be considered as derived from the masculine via suffixation" (Agirre & Garcia Mayo, 2013). The agreement between possessive and possessor is realized semantically (Agirre and Garcia Mayo, 2013), and morphological agreement is only exhibit for the third person singular (his - masculine, her - feminine, its - neuter) (Haegeman, 1994, in Agirre & Garcia Mayo, 2013). That is, "possessives express semantic properties of the possessor such as [+ human] [- human] and natural gender while possessum related properties are left unspecified" (Fabricius-Hansen et al., 2017:19), as in example (9) and (10):

(9) He is playing with his brother.

(10) She is playing with her brother.

(Agirre and Garcia Mayo, 2013:421)

Norwegian

In Norwegian, most of the possessive pronouns agree in number and gender with the noun they refer to (R. Strandskogen & Å. Strandskogen, 1995), as *min* 'my' in examples (11) and (12). However, some of them, like *hans* 'his', only have one form (Lødrup, 2011).

The Norwegian possessive pronouns can be pre-nominal (11) or post-nominal as in (12), (Anderssen et al., 2018b; Lødrup, 2011; Fábregas et al., 2019; Rodina & Westergaard, 2021):

(11) **Min** bil
my car
'My car'

(12) Bilen **min**
car.DEF my
'My car'

(Lødrup, 2011:340)

As described by Lødrup (2011), the noun that goes with the pre-nominal possessives has indefinite morphology, while it has definite morphology with post-nominal possessives. This word order variation depends on information structure, as the pre-nominal possessives normally indicate a contrastive interpretation (Lødrup, 2011; Fábregas et al., 2019; example (4) in Anderssen & Westergaard, 2010:2580). The post-nominal possessive pronoun is the more frequent option in spoken Norwegian, especially if colloquial (Strandgsoken, 1995; Lødrup, 2011).

As for the Norwegian grammatical gender system, several studies have investigated an ongoing change from a three-gender system to a two-gender system (Rodina & Westergaard, 2021).

Norwegian reflexives agree in gender and in number with the noun, and gender is only marked in the singular forms, as in example (13).

(13) Norwegian reflexive pronouns
Sin (M) - si (F) - sitt (N) - sine (PL)

Norwegian local or reflexive pronouns are used when the possessor is the local subject (Strahan, 2001), as in example (14) from this study's experimental items:

(14) Maria ringer broren sin en gang i uken.
Maria call-3 brother.DEF his one time a week
'Maria calls her brother once a week'.

2.3.1.1 Summary of possessive characteristics

In sum, the study highlights significant variations in the way possession relationships are established among the three languages. A summary of the key features is presented in the Table 4.

Table 4 - Summary of possessive characteristics in ITA, ENG, and NOR in post-nominal constructions.

Post-nominal possessives	Italian	English	Norwegian
Possessor agreement	X	✓	X
Possessum agreement	✓	X	✓

Notes: ✓ = the property is present; X = the property is not present. For English, values are shown for 3rd person singular. For Norwegian, values are shown for local and reflexive forms. For clarity purposes, the table demonstrates possessor agreement as well, notwithstanding, this study solely focuses on possessum agreement and does not evaluate possessor agreement.

With regards to post-nominal possession, Italian and Norwegian share similar features compared to English.

2.3.2 Topicalization

This section briefly outlines the differences in word order among the three languages, with a particular focus on topicalized structures, which are included in the experimental design. Topicalization refers to "the syntactic mechanisms and constructions available in a language to mark an expression as the topic of the sentence" (Cruschina, 2021). As in Kayne (1995, in Westergaard, 2003), SVO is assumed to be a basic word order and the sole underlying sequence permitted by Universal Grammar. Conversely, the V2 word order is less standard and is believed to arise from the movement of the verb to the C position (Westergaard, 2003).

In the context of word order, it is important to mention the phenomenon of verb-second, or rather "the phenomenon where the finite verb is required to appear in the

second position of a declarative main clause preceded by a single arbitrary constituent" (Angelovska et al., 2020:120), and which has received significant attention in Generative Grammar concerning Germanic languages (Angelovska et al., 2020).

Previous research is limited (Sağın Şimşek, 2006; Bardel & Falk, 2007; Hopp, 2018; Angelovska et al., 2020; Stadt et al., 2020) and has presented conflicting findings regarding the placement of verbs in L3 (Angelovska et al., 2020; Dahl et al., 2022), consequently, the present study incorporates this topic into its experimental design to further investigate the issue.

Italian

In Italian, SVO is a natural order for sentences with any transitive and some intransitive verbs (Nigel, 1997). The subject's placement between the verb and object is infrequent and tends to serve a rhetorical function. Indeed, the OVS order might arise for "discourse salience (focus) reasons" (Rothman et al., 2019:53). Conversely, adverbs and subcategorized adjectives commonly intervene between the verb and noun in Italian sentences (Nigel, 1997), as in the following examples (15) and (16):

(15) Parla bene l'italiano.
Speak-3 well the Italian
'He speaks Italian well.'

(16) Il professore ha fatto felici tutti gli studenti.
The teacher have-3 made happy all the students
'The teacher made all the students happy.'

(15 and 16 are adapted from Nigel, 1997:305)

When it comes to temporal expressions, they are found at the beginning of the sentence (17), and they are considered "cases of the topicalization construction in which a non-subject constituent is topicalized to the sentence-initial position" (Cruschina, 2021).

(17) In autunno, Cinzia inizierà a lavorare in ufficio.
In autumn Cinzia start.FUT to work in office
'In autumn, Cinzia will begin working in the office.'

English

English is an SVO language also referred to as residual V2 (Rizzi, 1996) due to subject-auxiliary inversion in *yes/no* questions and *wh*-questions (Westergaard, 2003; Westergaard, 2007; Dahl et al., 2022). In other words, English "is not a typical V2 language" (Westergaard, 2007:108), at least not as the other Germanic languages (Westergaard, 2007). Example (18) shows the typical word order in contemporary English:

(18) John hates beans

(from Speyer, 2005)

The only permitted movement (V-to-I) in a declarative main clause is the auxiliary movement across the adverbial (Westergaard, 2003), as seen in (19):

(19) Peter has *always* played the piano.

Hence, English has non-V2 in declaratives, with finite verbs appearing below sentence adverbs (Westergaard et al., 2017), as in (20):

(20) Emma *often* eats sweets.

In the occurrence of topicalized structures, defined as structures where there is the "movement of an element other than the subject to the left edge of the sentence" (Speyer, 2005:243), the word order is as in (21):

(21) Once a week, Emma eats sweets.

In other words, the declarative main clause is preceded by the adverbial phrase, and the finite verb precedes the object.

Norwegian

The Norwegian language has SVO word order and is considered a V2 language, as all other Scandinavian languages (Bentzen, 2003), with the verb in the second position in all main clauses (Westergaard, 2003; Dahl et al., 2022), as in (22):

(22) Jeg hører på radioen i bilen hver dag.
I listen to radio-DEF in car-DEF every day
'I listen to the radio in the car every day.'

(Westendorp, 2021:1)

However, OVS order might arise "for object emphasis, related to its V(erb) second (2) rule" (Rothman et al., 2019:53). In both main and embedded clauses, the finite verb precedes the object (Westendorp, 2021). However, the subject does not necessarily precede the verb. For instance, when a declarative main clause starts with something other than the subject, the finite verb should directly follow that constituent instead of the subject (Westendorp, 2021), as in (23):

(23) Hver dag hører jeg på radioen i bilen.
Every day listen I to radio-DEF in car-DEF
'Every day, I listen to the radio in the car.'

(Westendorp, 2021:2)

That is because Norwegian is assumed to have verb movement to C in all types of main clauses, resulting in topicalised structures, as in (X) (Westergaard, 2003; Dahl et al., 2022). In subordinate clauses, the verb doesn't generally move, as the C position is filled by the complementizer (Bentzen, 2003). However, if the subordinate clauses are topicalised, embedded V2 is sometimes possible whereas "bridge-verbs" are present (Bentzen, 2003).

In sum, there is subject-verb inversion in non-subject-initial clauses, and whether it happens or not depends on pragmatic/discourse factors (Anderssen et al., 2018a).

2.3.2.1 Summary of topicalization

The subsection discussed the phenomenon of topicalization in the languages of the study: Italian, English, and Norwegian. Topicalization is the placement of a constituent, such as a subject or object, at the beginning of a sentence for emphasis or to make it more salient.

Nonetheless, it was essential to highlight the typical word order for each language, as there are variations that need to be acknowledged. In Italian, SVO is the natural order for sentences, but the subject's placement between the verb and object can occur for rhetorical purposes. In English, the only permitted movement in a declarative main clause is auxiliary movement across the adverbial. Norwegian, on the other hand, is considered a V2 language, with the verb in the second position in all main clauses, but subject-verb inversion can occur in non-subject-initial clauses depending on pragmatic/discourse factors.

Consequently, while the fundamental word order may be similar among the three languages, they exhibit variations in terms of constructions that involve topicalization, which are depicted in the table below.

2.3.3 Adverbial placement in main and subordinate sentences

A brief overview of notable typological distinctions in sentence structure and adverb placement across the three languages is provided, as these variations could have significant implications for the understanding of potential transfer effects. Several studies (see section 2.4) within the L3A field have been investigating verb placement, with a focus on Adv-V word order (Stadt et al., 2020).

Among the several classes of adverbs, adverbs of *frequency* were chosen to test cross-linguistic influence in this study. Adverbs of time, or adverbial phrases of time, help to indicate the time when an action or event took place or the frequency with which it takes place (Proudfoot & Cardo, 2012). Specifically, the adverbs *aldri*, 'never' and *alltid*, 'always' were included in the experimental items.

Italian

As mentioned by Larsson et al. (2020, referring to Osborne, 2008:127), learners whose L1 has obligatory verb-raising, i.e., Italian, show a strong tendency to use V-Adv-O order in declarative main sentences of their target language. That is because when adverbs modify a verb, they generally follow it (Maiden & Robustelli, 2000). However,

the adverb may also appear, not only immediately after the verb, but also after the complement of the verb (24):

(24) Esamina i libri attentamente.
Examine-3 the books carefully
'He/she carefully examines the books.'

Or between an auxiliary or a modal verb and the following participle, gerund or infinitive:

(25) Sta attentamente esaminando i libri.
Is-3 attentively examining the books
'He/she is attentively examining the books.'

(24 and 25 are adapted from Maiden and Robustelli, 2000:207)

The Italian counterparts of the Norwegian adverbs *alltid* and *aldri* are, respectively, *sempre* 'always', and *mai* 'never', and they are contextualized in the following examples (26) and (27):

(26) Io ho **sempre** fame.
I have always hunger
'I am always hungry.'

(27) Tu non mangi **mai**.
You not eat never
'You never eat.'

In Italian, the adverb *mai* 'never' needs to be preceded by the preverbal negative marker *non* 'not', e.g., example (27). Having a negative meaning, and being accompanied by the negative marker *non*, the adverb *mai* is always found as a double negation (DN). Indeed, the Italian language licenses a "DN reading of multiple negative constructions in which, along the lines of propositional logic, the two negative elements cancel each other out, yielding an affirmation" (Tagliani et al., 2022).

Despite only being found in DN constructions, the rules for the positioning of negative adverbs such as *mai* are those applying to other adverbs (Maiden & Robustelli, 2000).

English

In the English language, the class of adverbs is mixed and "notoriously difficult (...) to define, both semantically and grammatically" (Börjars & Burridge, 2001:66). This difficulty stems from its heterogeneity (Quirk et al., 1985; Huddleston & Pullum, 2002).

Many adverbs are formed from adjectives, but they don't necessarily have the same form (Dypedahl & Hasselgård, 2018:67, examples 28 and 29), even if a certain overlap exists (Quirk et al., 1985).

(28) Your voice is beautiful.

(29) You sing beautifully.

In English, the sentence position of an adverb is determined after all the "important" elements have been allocated (Ordeman, 1932). In other words, adverbs have an approximate and relatively free position (Ordeman, 1932; White, 1991) that is mainly conditioned by their lexical nature (López, 1995).

For instance, English allows adverbs in several positions (White, 1991):

(30) SVOA: John drinks his coffee *quickly*.

(31) ASV: *Carefully*, John opened the door.

(32) SAV: Mary *often* watches television.

(33) No: SVAO: *Mary watches *often* television.

The adverbs 'always' and 'never' are by some (Quirk et al., 1985; White, 1991) considered as *frequency* adverbs, while by others (López, 1995:197) are described as *aspectual* adverbs. In this study, it is referred to as adverbs of frequency, as they, by definition, refer to "a span of time" (Quirk et al., 1985).

(34) Apples *always* taste best when you pick them straight off the tree.

(35) I could *never* swim fast.

(34 and 35 are from The Cambridge online Dictionary)

In English, frequency adverbs appear pre-verbally (Stadt et al., 2020), as in (34-35).

In the context of the experiment, English relative clauses have been employed. Relative clauses are referred to as such because they "are related by their form to an antecedent" (Huddleston et al., 2002). Their structure contains an anaphoric element that refers back to the antecedent and can be either explicit or implicit. In the explicit case, the relative clause contains a relative pronoun such as "who," "whom," "whose," or "which," which marks the clause as a *wh*-relative (Huddleston et al., 2002). For instance:

(36) Here is Maria, who always/never trains at the gym.

In case a frequency adverb is contained, as in example (36), it follows the relative pronoun.

Norwegian

In their study on epistemic adverb placement, Larsson et al. (2020:160) indicate that Norwegian, as other Germanic languages (unlike English), is a verb-second language (V2), which implies that "an adverb (or full adverbial) placed in the clause-initial position (I) triggers inversion of the subject and the finite verb" (Bentzen, 2005; Larsson et al., 2020). The movement of the finite verb to I "has been correlated to rich verbal inflectional morphology" (Bentzen, 2005:155), even if also being possible in languages lacking it (Bentzen, 2003, 2005). Due to the obligatory movement of finite verbs to C in main clauses in Norwegian, both topicalized structures and sentences with sentence adverbials have the finite verb as their second constituent (Listhaug et al., 2021).

Topicalized structures:

(37) På mandager spiser jeg fisk.
On Mondays eat I fish
'On Mondays I eat fish.'

Adverbial structures:

(38) Jeg spiser alltid klokka 7.
I eat always clock 7
'I always eat at 7.'

For the purposes of this study, the frequency adverbs *alltid*, 'always' and *aldri*, 'never' were employed in both main (39) and subordinate (40) sentences:

(39) Jeg hører alltid/aldri på radioen i bilen.
I listen always/never on radio-DEF in car-DEF
'I always/never listen to the radio in the car.'

(40) Her er Merete, som alltid/aldri hører på radioen i bilen.
Here is Merete who always/never listen to radio-DEF in car-DEF
'Here is Merete, who always/never listen to the radio in the car.'
(adapted from Westendorp, 2021:2)

In Norwegian, adverbials can therefore appear in a post-verbal position in main clauses, and in a preverbal position in subordinate clauses (Westendorp, 2021).

2.3.3.1 Summary of adverbial placement

In summary, the languages under investigation exhibit diversity concerning the positioning of adverbs. The comparison between the main and subordinate conditions will provide crucial information about CLI, as the Norwegian adverbial structure overlaps with Italian in main clauses, but not English, and with English in subordinate clauses, but not Italian.

In the Italian language, adverbs invariably come after the verb, while in English, they precede the verb. In Norwegian, both constructions are viable, though in different contexts. Post-verbal positioning of the adverb is allowed only in main sentences, not in subordinate clauses.

2.3.4 Summary of the properties

The following Table 5 presents the stylized listing of the aforementioned constructions. The gender agreement between reflexive pronouns and possessor is observed

exclusively in Italian and Norwegian. Among topicalized constructions, Norwegian is the sole language permitting V2 word order. In adverbial clauses, Italian and Norwegian exhibit a shared V-Adv word order in main clauses, whereas in subordinate clauses, Italian alone allows the V-Adv word order.

Table 5 - Overview of the investigated properties among ITA, ENG, NOR.

	Italian	English	Norwegian
Possessum gender agreement	✓	X	✓
V2	X	X	✓
V-Adv main	✓	X	✓
V-Adv sub	✓	X	X

Notes: ✓ = the property is present; X = the property is not present.

2.4 Previous literature

This subsection presents some relevant studies which address the theoretical background and proposals just discussed.

As for the models of L3A, the L1 Factor (Hermas, 2014) argued that the L1 is the privileged language to be transferred in L3A, and the same author found evidence for it in studies on the early stages of L3A concerning English morphosyntax in learners with L1 Arabic and advanced L2 French proficiency (Hermas, 2010, 2014). The primary focus of Hermas' research was to examine the acquisition of the English verb movement parameter (Hermas, 2010, 2014) and the null subject parameter (Hermas, 2014). Findings from both investigations consistently revealed the presence of morphosyntactic transfer from L1 Arabic to L3 English during the early stages of language acquisition. In the studies, the author claims that L1 (Arabic) would override "the effect of language proximity, typology and psychotypology" (Hermas, 2014:1).

Moving on, empirical evidence for the L2 Status Factor (Bardel & Falk, 2007; Falk & Bardel, 2011) has been found in Bardel and Falk's (2007) study, which explored the acquisition of L3 Dutch and Swedish in terms of the placement of sentential negation within main finite clauses. Notably, both Dutch and Swedish are classified as V2 languages. The experimental participants consisted of two distinct groups: one

comprised individuals with a non-V2 L1 and a V2 L2, while the other group consisted of individuals with a V2 L1 and a non-V2 L2. Results of the study showed that the placement of negation exhibited a greater degree of transfer from the L2 compared to the L1, leading to the conclusion that the L2 holds a privileged position as the primary source of transfer during the initial stages of L3 acquisition, especially as the L2 "acts like a filter, making the L1 inaccessible" (Bardel & Falk, 2007:480).

Additional empirical support for the L2 Status Factor (Bardel & Falk, 2007; Falk & Bardel, 2011) was provided by Falk and Bardel (2011) through their examination of object pronoun placement in L3 German. The study involved participants who were learning German as their third language and were divided into two groups. The first group consisted of individuals with English as their L1 and French as their L2, while the second group comprised individuals with French as their L1 and English as their L2. The task employed in the study was a grammaticality judgment and correction task (GJCT). Drawing upon the findings, which revealed instances of both positive and negative transfer from the L2, the authors corroborate their claim regarding the predominant influence of the L2 rather than the L1 in the acquisition of the L3 language.

Evidence for the TPM (Rothman, 2011, 2015) has been found initially in Rothman (2011), where it has first been proposed. Further findings were found in Rothman (2013, 2015), and in many other current studies of L3 CLI at early stages, such as Rothman and Cabrelli Amaro (2010), Giancaspro et al. (2014), Puig-Mayenco and Marsden (2018), and Ben Abbes (2020). However, it is important to note that the TPM model by Rothman (2011, 2015) is not extensively explored or directly applicable to the current experiment, as for its focus on initial states learners. Therefore, a detailed examination of the TPM model would exceed the intended scope of this study.

Moving on, the Cumulative Enhancement Model (CEM, Flynn et al., 2004) is tested by the same author with an experiment examining the understanding of English restrictive relative clauses among two groups: an adult group with L1 Kazakh, L2 Russian, and L3 English, and a child group with L1 Kazakh and L2 English. Kazakh is characterized as a head-final and left-branching language, while English and Russian are head-initial and right-branching languages (Flynn et al., 2004). The results indicated that the adult L3 English group achieved significantly higher performance compared to the child L2 English group. The difference in accuracy is attributed by Flynn et al.

(2004) to the adult learners' prior knowledge of L2 Russian, which exerted a facilitative transfer in L3 English. In contrast, the L2 child group exhibited lower accuracy in their acquisition of relative clauses in English, as their L1 Kazakh did not contribute to enhancing their understanding due to the distinct structures present in both languages. These findings, according to Flynn et al. (2004), lend support to the CEM, by demonstrating that neither the L1 nor the L2 holds a privileged role as the primary source of transfer. Instead, "all previously known languages are available to the learner to constructively enhance subsequent language learning" (Berkes & Flynn, 2012).

The study conducted by Westergaard et al. (2017) provides academic support for the Linguistic Proximity Model, as evidenced by empirical data. According to the authors, the primary factor leading to CLI in L3A is attributed to "abstract linguistic properties" (Westergaard et al., 2017). These properties enable both facilitative and non-facilitative influence, which is possible from all previously acquired languages (Westergaard et al., 2017). Their study investigated the acquisition of word order in child L3 English by L1 Russian-Norwegian bilinguals. The experiment involved three distinct cohorts of young adults aged between 11 and 14 years, namely: Norwegian-Russian bilinguals, Norwegian monolinguals, and Russian monolinguals. A comparative analysis was performed on the performance of these groups in a GJT (Grammaticality Judgment Task), comprising two word order conditions pertaining to verb movement. Ultimately, it was observed that L1 Norwegian children would over-accept ungrammatical sentences in English with a V2 resembling word order, while Norwegian-Russian and L1 Russian children were more sensible to these grammatical violations (Westergaard et al., 2017). Additionally, the bilingual group scored lower than L1 Russian children, "suggesting the presence of non-facilitative influence from Norwegian" (Westergaard et al., 2017; see also Westergaard 2021). In brief, the performance of the bilingual group was influenced by both of their prior languages, which were equally accessible sources of CLI.

Evidence of detrimental transfer as in the Scalpel Model (Slabakova, 2016) is investigated by the same author in the study of Slabakova and García Mayo (2015) on English left dislocation constructions. Slabakova (2016) argued against wholesale initial transfer as the "activated grammatical possibilities of the L1-plus-L2 combined

grammar act with a scalpel-like precision, rather than as a blunt object, to extract the enhancing, or facilitative, options of L1 or L2 parameter values" (Slabakova, 2016:5).

The empirical evidence for it is found in the study of Slabakova and García Mayo (2015) involving two trilingual groups, specifically L1-Basque-L2 Spanish-L3 English and L1-Spanish-L2 Basque-L3 English, along with a bilingual group of L1 Spanish-L2 English. Notably, the two trilingual groups exhibited intriguing findings, as they faced challenges in reliably discriminating between acceptable and unacceptable topicalization structures, while the other investigated structures did not pose the same challenges. Importantly, regardless of whether Spanish was acquired as a first or second language, it exerted a detrimental impact on the grammatical proficiency of the participants in their L3 English acquisition. Additional support for the Scalpel Model (Slabakova, 2016) emerged from a recent investigation conducted by Angelovska et al. (2020), which focused on L3 learners with L2 German and possessing various non-V2 L1 backgrounds. Their findings showed that L1-dominance played a crucial role in determining accuracy performance among L3 learners with lower proficiency levels. Furthermore, increased proficiency in the L3 language would result in less transfer from the L1.

As for the extra-linguistic variables, a study that deals with the role of language proficiency is the one of Perić and Novak Mijić (2017), which they investigated by following the assumption of a number of authors (Ringbom, 1987; Williams & Hammarberg, 1998) stating that language proficiency in previously acquired languages has a significant role in cross-linguistic transfer. The study focused on lexical CLI in Spanish L3A. Participants consisted of a group of L1 Croatian, L2 English college students. However, in the same study (Perić & Novak Mijić, 2017) proficiency in the target language is recognized as equally significant, following the speculation of Bardel (2010) and Williams and Hammarberg (1998). Additionally, the findings indicated that the nature of language transfer is associated with "formal similarity of certain features or language components" (Perić & Novak Mijić, 2017:91), and that for this reason the L2 English was found to be the main source of transfer.

The role of proficiency as an extra linguistic factor has also been studied by a number of studies that rely on language production data (Angelovska & Hahn, 2014;

Bardel & Falk, 2007; Falk & Bardel, 2010). Those studies have shown that proficiency affects the source and extent of transfer in L3 acquisition (Angelovska et al., 2020).

As language proficiency is only "one component of language dominance" (Angelovska et al., 2020:119) it is also important to mention previous studies dealing with the role of language dominance in transfer selection. Angelovska et al. 's (2020) findings show that "dominance was the determining key factor for accuracy performance for low proficiency L3 subjects" in their study. Additionally, Fallah and Jabbari's (2018) findings suggest that the dominant language of communication for the participants in their study significantly influenced CLI during the initial stages of L3A, regardless of whether their dominant language was their L1 or L2.

In González Alonso et al. 's (2021), they examined the progression of English as an L3 among bilingual individuals proficient in Spanish and Catalan, employing a controlled environment where language acquisition order was systematically varied and balanced. The study included participants with different levels of bilingual dominance and specifically focused on the initial stages of L3A within a constrained setting of exposure to the third language. However, language dominance did not appear to play a crucial role. Likewise, in Puig-Mayenco et al. 's (2022) study, extralinguistic factors such as language dominance did not serve as determinants for transfer selection in L3 acquisition.

Properties investigated in the study, previous findings

In the preceding section, the focus was on research pertaining to the models of L3A. However, the subsequent literature regards the specific properties that were examined in the study.

Possessive pronouns are included in a study by Lago et al. (2018) on the role of native and non-native grammars in the comprehension of possessive pronouns, two groups of German speakers with inverse L1-L2 distributions (Spanish-English) were tested. Differences in processing German possessive pronouns were observed between groups. The findings of their study revealed that the participants' reading comprehension scores were primarily influenced by their native grammar. However, the participants' L2 proficiency level impacted their judgments accuracy, resulting in heightened sensitivity to morphosyntactic violations among highly proficient L2

participants. The authors (Lago et al., 2018) suggested that L1 effects are automatic and reflect native processing mechanisms, while L2 effects require “explicit deployment of metalinguistic knowledge” (Lago et al., 2018). In brief, the authors claimed that multilinguals' prior grammatical knowledge can affect their real-time reading and comprehension of a language.

Studies of L3A featuring adverb placement are numerous (Hopp, 2018; Falk, 2010; Westergaard et al., 2017; Stadt et al., 2020; Listhaug et al., 2021; Abdollahi D., 2022; Kolb et al., 2022). However, none of these studies have specifically examined the adverb-verb word order in both main and subordinate clauses simultaneously.

For instance, Listhaug et al. (2021) investigated the acquisition of verb movement in L3 French L1 Norwegian L2 English by looking at and V2 and V3 in subject-initial declaratives with sentence adverbials, as well as V2 and V3 in topicalized structures. While Norwegian and French share a similar "surface word order" for sentence adverbials, this is not the case in Norwegian (Listhaug et al., 2021). The study involved high-school and university students, and the results did not indicate any privileged status for either the L1 or the L2 in terms of transfer effects.

On the other hand, even if the V2 phenomenon in Germanic languages is well studied (Angelovska et al., 2022) previous research including topicalized structures in L3A is limited (Sağın Şimşek, 2006; Hopp 2018) and presents conflicting findings (Angelovska et al, 2020; Dahl et al., 2022). The first study reporting on the non-facilitative transfer of V2 in L3A is the one of Sağın Şimşek (2006; in Angelovska et al., 2020), on the L3 acquisition of English by Turkish-German bilinguals. The findings revealed that bilingual participants tended to apply the German V2 rule to English sentence structures, which can be attributed to the typological similarities between the two languages.

A similar language pairing in the study of V2 structures has been investigated by Hopp (2018) by using a sentence repetition task and a picture story retelling task. The participants were groups of Turkish-German bilinguals and monolingual German L1 children learning English. In both groups, German was the sole transfer source.

3 The present study

The third chapter is devoted to outlining the aims, research questions, and hypotheses of the study. The initial section of the chapter, designated as section 3.1, presents an overview of the study's primary objectives. Following this, section 3.2 includes the research questions that guided the investigation, as well as the hypotheses posited to address them.

Hence, this chapter aims to provide a clear overview of the study's fundamental aims and objectives before moving on with the investigation.

3.1 The scope

The aim of the present study is to contribute to the ongoing debate in L3 study regarding the source of crosslinguistic influence (CLI) by investigating the role of English as an L2 in L1 Italian speakers learning L3 Norwegian.

It is noteworthy that this study pertains to an unconventional combination of languages which has received limited attention in L3A previous research. While in the field exist numerous studies exploring English, none have specifically examined its relation to a trilingual combination comprising Italian and Norwegian. The English and Norwegian combination is being investigated in other contexts, such as the works of Pedersen (2016), Listhaug et al. (2021), and Dahl et al. (2022).

Additionally, none of the previous studies examining adverbial sentence structures have included both main and subordinate clauses within the design of their investigations of L3A in adults (cf. Hopp 2018, for children heritage acquisition). This is particularly significant considering the distinctions present in Norwegian which share similarities with English but differ from Italian in relation to main clauses, and conversely for subordinate clauses (as in the previous 2.3.3) and exploring both clause types would enable stronger claims regarding the obtained findings. Indeed, the existent literature concerning the subject matter is primarily characterized by a narrow focus on individual linguistic properties in isolation, or at best, only two (Westergaard et al., 2022), it was therefore crucial to investigate multiple linguistic properties in this study.

Moreover, only a limited amount of research suggests that non-native language interference might persist even after the initial stages of L3 acquisition (Tomoschuk et

al., 2021). Additionally, the findings of Tomoschuk et al. (2021) suggest that language control mechanisms may vary across different stages of language acquisition. Hence, in this study the proficiency level attained in the previously acquired language(s) and their length of usage are considered as crucial variables in investigating CLI in third language acquisition.

In order to accomplish this, a group of 16 L1 Italian with L2 English and L3 Norwegian speakers were subjected to assessment, utilizing a range of distinct linguistic characteristics that would exhibit variation across the three languages. A pilot study with Norwegian native speakers (n=10) is also included.

3.2 Research questions and hypotheses

Given the previous literature and the ongoing debate regarding the nature and origins of CLI in L3A, the present study aims to answer the following research questions, investigating the role of English in the acquisition of Norwegian as L3 by Italian native speakers:

RQ1: Is there transfer from L2 English?
RQ2: If there is any transfer from English, what is its nature? Is it facilitative, non-facilitative, or both?
RQ3: Do extra linguistic variables in English modulate the degree of transfer?

The hypotheses (H) are summarized as it follows:

As per typological similarity between English (L2) and Norwegian (L3), transfer is predicted to happen (H1), regardless of the transfer being facilitative or non-facilitative (LPM, Westergaard et al., 2016,2019; the Scalpel Model, Slabakova, 2016), (H2). In relation to the extra-linguistic variables (H3), it is expected that a high level of English proficiency might be correlated with more target-like performance in the L3. Notably, English use and input are also expected to have an impact, and more English use may lead to more transfer.

As for the specific properties, the predictions are given below. During the self-paced reading task of the experiment, it is anticipated that pilot participants who are

native speakers of Norwegian will demonstrate discernible differences in their Reading Times (RTs) while processing sentences that are grammatically correct or incorrect in their L1 Norwegian, because of native competence.

Conversely, it is predicted that individuals with L1 Italian will manifest heterogeneity in their RTs. Gender agreement testing structures are predicted to elicit either a facilitative transfer from Italian, or a non-facilitative transfer from English. Instead, topicalized structures in Norwegian do not share similarities with either English or Italian. Hence, only non-facilitative transfer is predicted to happen, in case. With regards to sentences containing adverbs, it is predicted that in main clauses, transfer from English could only be visible in a non-facilitative effect.

Nonetheless, Italian might exert a facilitative effect and enhance sensitivity to grammatical violations, while the opposite could be true for subordinate clauses. In brief, English transfer could potentially have a facilitative effect, while the impact of Italian transfer may only manifest as non-facilitative.

Table 6 - Differences and similarities of the investigated languages among the investigated properties.

Possessive gender agreement	$L1_{ITA} = L3_{NOR} \neq L2_{ENG}$
Topicalization	$L1_{ITA} = L2_{ENG} \neq L3_{NOR}$
Adverbial word order (main)	$L1_{ITA} = L3_{NOR} \neq L2_{ENG}$
Adverbial word order (subordinate)	$L2_{ENG} = L3_{NOR} \neq L1_{ITA}$

Additionally, following the findings of several studies (Bardel & Falk, 2012; Faldet Listhaug et al., 2021; Dahl et al., 2022), the possibility of transfer from English (L2) may only be viable in speakers with a relatively low level of proficiency in the same language, as their linguistic competence is not stable and more prone to be transferred. Additionally, greater L2 use could exert greater L2 "activation", therefore making it more prone to transfer (Stadt et al., 2020).

To test the hypotheses, an empirical experiment was conducted. The methodology and details of the experiment are delineated in the subsequent Chapter 4.

4 Methodology

The methodology of this experimental study is presented in this Chapter as follows. To start with, section 4.1 elucidates details concerning the participants and the recruitment process. Then, section 4.2 discusses the tasks and materials, including the language background questionnaire (LHQ), the self-paced reading task (SPR), the proficiency tests, and the English forced choice task. All experimental materials are available at the Center for Open Science Framework website[1].

The presentation of the results and the analysis of the findings are reported, respectively, in Chapters 5 and 6.

4.1 Participants

The participants were recruited with the help of three educational institutes based in Italy: *La Sapienza* the University of Rome, *La Statale* University (Milan), and *Istituto Culturale Nordico* (Milan). Upon agreement, the participants were recruited from Norwegian language courses for Italian students of the same institutes. All the institutes, except *Istituto Culturale Nordico*, are public universities. The participants were enrolled in the Faculty of Humanities and were taking either a Bachelor's or a Master's degree in Languages and Literature.

However, given the relatively small number of participants enrolled in the language courses, it was necessary to incorporate individuals who were not university students but were engaged in private or online Norwegian language courses. They were recruited through Facebook groups and word of mouth.

Originally, 42 participants signed up for the experiment by completing the language history questionnaire (LHQ). The questionnaire included demographic and language learning information from participants, including their current age, age at which L2 and L3 learning began, self-assessed proficiency in the L1, the L2, and L3,

[1] The link for the project is:
https://osf.io/3rwc5/?view_only=945a2d5a658b4f038e851927d8233755

years of L2 and L3 instruction received, language spoken at home, self-assessed comprehension ability in L1, L2, and L3.

Subsequently, those individuals who did not meet the prescribed inclusion criteria, including two non-Italian native speakers and several non-residents of Italy (n=5), were excluded. Additional participants were excluded on the basis of their proficiency in languages other than Italian, e.g., Spanish, as well as their voluntary non-participation in the experiment by declining to complete the questionnaire. Only one participant was excluded from the study as a result of self-reported dyslexia. In the end, data from three participants were excluded from the analysis. Indeed, ITA_003, ITA_009, and ITA_011 were excluded because of their low scores in the distractor section of the SPR. The bio and information of the excluded participant have not been incorporated into the tables.

Despite the complexity and difficulty that may arise from incorporating learners who possess multiple L3s, it was necessary to do so given that Italian students are obligated to complete a minimum of three years of instruction in a third language. Indeed, it is important to mention that the Italian educational system mandates the inclusion of French or Spanish language education within the curriculum during the compulsory school attendance period. English is the most commonly studied language among Italian high school students. In 2019, 99.6% of Italian students were reported to be studying English (Balduzzi, 2019). In the same year, French and Spanish were the second and third most studied languages, with 16.2% and 14.8% of students studying them, respectively. German was the fourth most studied foreign language, while Russian was studied by only a small percentage of students, at 0.4% (Balduzzi, 2019).

However, the majority of Italian teenagers discontinue the acquisition of this language(s), resulting in eventual loss of proficiency over time.

4.1.1 Sociolinguistic background information

Sixteen participants, ranging in age from 19 to 40 (M=26,06), were included in the study. Among the participants, 11 identify as female, 1 identifies as non-binary, and 4 identify as male. All were native speakers of Italian, with English as their L2. All study participants possess knowledge of the English language, which they acquired between the ages of 5 and 10. The length of their exposure to and utilization of the English

language appears to be correlated with age, with older participants reporting a more extended duration of language use.

All participants have completed their secondary education, with the majority (n=14) currently pursuing or having already achieved a bachelor's degree. The remaining participants (n=2) are enrolled in or have completed postgraduate studies at the Master's level. Their language of instruction was reported to be Italian until the start of their university studies.

In the study, participants were asked to report their duration of Norwegian language studies, which varied among the participants, with the shortest duration being 5 months and the longest being 17 years. On average, the participants reported having studied Norwegian for 3,57 years (SD=3,91). Notably, the maximum reported duration of 17 years was an outlier, as it was considerably higher than the majority of the reported durations.

Participants also reported their English and additional languages proficiency (SEP) on a scale 1-7, (1=Molto limitata, 'Very poor'; 7=Ottima/Nativa, 'Native like'). They were presented with the instructions: "Q19. Valuta le tue abilità di ascolto, parlato, lettura e scrittura in ogni lingua che hai studiato o imparato" (Please rate your current ability in speaking, reading, writing, and understanding in each language). For English, the data indicates that the minimum recorded score had a value of 5=Buona 'Good', while the maximum recorded score was categorized as 7=Ottima/Nativa 'Native like'. The average score, computed as the mean value, was M=6,28.

Among the participants, ten reported having undertaken a standardized English proficiency examination between 2004 and 2023, for instance, IELTS or Cambridge. The majority of respondents (n=8) demonstrated a high degree of English fluency, obtaining a C1 or C2 level of proficiency. The remaining participants either self-reported a B2 level of English proficiency (n=2) or did not undertake a standardized proficiency test (n=7).

All participants in the study attested the exclusive use of their native language, Italian, during family interactions, with no reported use of the English language. Employment of English within the domestic sphere was constrained to activities such as viewing television, completing school assignments, or engaging in recreational

reading. Among the participants, a majority of 17 individuals indicated the incorporation of English language in their educational or occupational spheres, with a minority of 1 individual revealing infrequent utilization of this language.

To calculate each participant's daily use of English, elements from Q22 and Q23 (see the online repository) of the LHQ were incorporated.

Table 7 - Participants information regardin extra-linguistic variables.

	M	**SD**	**range**
Self-rated ENG proficiency	6,28	0,70	1-7
Self-rated NOR proficiency	3,25	1,69	1-7
Self-reported ENG usage	9,45	4,46	0-24 (hours)
Self-reported NOR usage	1,81	1,86	0-24 (hours)
Length of ENG studies	19,43	5,85	13-31
Length of NOR studies	3,57	3,91	0,5-17

Notably, participants reported exposure to various languages other than English, such as Spanish (n=5), French (n=5), German (n=4), Russian (n=1). As verified through the questionnaire, the languages in question were first introduced to the participants during their secondary education, and none of them have achieved more than a B2 fluency in these languages. Some participants (n=5) did not mention any additional language besides English and Norwegian, but it is assumed that they were still taught French, Spanish, or German during their high school years.

4.2 Tasks and materials

The web-based platform Gorilla Experiment Builder (www.gorilla.sc, Anwyl-Irvine et al., 2018) was used to create and conduct the experiment. It consisted of four tasks, presented in the following order: (1) the self-paced reading task (SPR), (2) the Norwegian proficiency task, (3) the English proficiency task, and (4) the English forced choice task.

Before starting the experimental session, which was entirely online, the participants were provided with information regarding the study's objectives, the nature of the tasks to be completed, an estimated duration of the experiment, and how their personal data would be managed and stored. As the experiment followed the guidelines regarding personal data processing, it was approved by the Norwegian Center for Research Data (NSD). All participants provided written consent to take part in the study when completing the LHQ.

The study consisted of a self-paced reading task (SPR) and language proficiency assessments in both English and Norwegian. The final task involved an English forced choice task, targeting the same structures investigated with the SPR task. Of particular importance was the determination of the participants' level of English proficiency, specifically with regards to their command of reflexive possessive forms ("his" and "her"), adverbial word order, and topicalization structures. If the participants' scores had been excessively low, it would have been impossible to accurately ascertain the influence of the English language on their reaction times during the self-paced reading task.

A detailed account of each task is presented in the following sections. The instructions to each task were conveyed in the Italian language.

Upon completion of the experiment, each participant received an online gift card as a reward. The rewards were funded by grants received from The Institute of Language and Culture (ISK, Institutt for språk og kultur) at The Arctic University of Norway (UiT).

4.2.1 The Language History Questionnaire (LHQ)

The questionnaire was launched using Qualtrics (https://www.qualtrics.com) and it was adapted from the Language History Questionnaire (LHQ) created by Li et al. (2006); it was then translated into Italian. As already mentioned, the LHQ is a web-based questionnaire that consists of a series of questions aimed at gathering information on the language history of the participants, which includes their age of second language acquisition, duration of second language education, self-rated proficiency in both their first and second languages, and the extent of language use in their home environment (Anderson et al., 2018).

It was necessary to present the questionnaire to the participants before the experiment to ensure the selection and screening of eligible individuals, as well as to collect crucial data about the extra-linguistic factors that may impact their performance in the experiment. Although all participants were native speakers of Italian, it was essential to assess their linguistic dominance as well. Hence, participants not residing in Italy and who demonstrated dominance in another language rather than Italian were excluded from the main experiment.

As previously mentioned, the questionnaire included demographic questions to categorize the participants in detail, such as age, gender, and education, and questions about their language experience. Moreover, it was crucial to establish their linguistic background and to exclude participants who were fluent in any other language than the ones analyzed in the present study.

Due to its extensive length, the comprehensive questionnaire could not be incorporated within the Appendix; however, it can be accessed in its entirety at https://osf.io/ (the complete link is found in 4.1).

4.2.2 Self-paced reading task (SPR)

A self-paced reading task, or SPR, is a "computerized method of recording a reading time for each designated segment (i.e., a word or a phrase) of a sentence or series of sentences that are presented as an experimental stimulus" (Jegerski, 2014).

To answer the research questions and determine the source of CLI, it was important to examine the characteristics that were common or different among the three languages used in the study. As in Westergaard et al. (2022), language learners tend to exhibit greater proficiency in acquiring grammatical features that are similar to those of their first language, as opposed to features that are divergent or entirely absent from their first language. Consequently, it is hypothesized that the English language proficiency level, duration of English language studies, and frequency of English language usage among the participants of this study may have an impact on their ability to accurately detect anomalies while reading Norwegian text. This hypothesis is tested with the employment of a SPR task, which can aid in addressing linguistic anomalies, which encompass the following:

> "Specific violations of grammar (i.e., error recognition or grammaticality paradigms) as well as inconsistent or non-canonical permutations of word order, semantics, discourse, and other syntactic and extra-syntactic factors that are presented in the experimental stimuli." (Jegerski, 2014)

The items were divided using a word-by-word segmentation, as it "yields more precise data because more data points are collected per stimulus", in comparison to a phrase-by-phrase segmentation (Jegerski, 2014). The SPR task consists of a cue, stimulus, and distractor. Upon initial use of the spacebar by the participants, the cue "+" would appear on the screen as an indication of the commencement of the sentence. The time elapsed (reaction time, RT) between each keypress is then recorded (Marsden et al., 2017). The visual presentation of each word (stimuli) would be situated within the central region of the participant's screen, and for this purpose, the utilization of smartphones was precluded for the execution of the experiment, with only computers being allowed by the software.

As a result of an unforeseen technical error, the actual number of items administered to the participants during the study differed from the originally planned number. Specifically, the intended design included a total of 86 items categorized as either grammatical or ungrammatical, with an equal binary distribution between the four syntactic categories (a,b,c,d – Table 8). Additionally, the number of distractor items was intended to be 28, but ultimately only 22 were included due to the aforementioned technical issue. In this section 4.2.2, we have reported the total number that was utilized.

The SPR task consisted of 80 items, 3 of which were included in the practice part (Table 8): (a) 14 items for the gender agreement of possessive reflexives, 7 grammatical and 7 ungrammatical; 30 items testing the (c, d) Adv-V word order, 15 of which in main clauses, and the other half (n= 15) in subordinate clauses. In each group, 7 items were grammatical and 8 were ungrammatical. The last 15 items tested (b) topicalization, 8 of them being ungrammatical and 7 being grammatical.

The presence of ungrammatical items, hence linguistic violations in stimuli, commonly results in prolonged reading times at or subsequent to the point of violation, ostensibly due to the challenge of integrating a discordant word into the preexisting sentence representation during the parsing process (Jegerski, 2014). In addition, the filler sentences used in the study (n=18) were designed to be unrelated to the properties

in the study. The inclusion of grammatically correct filler sentences aimed to highlight and contrast the ungrammatical features present in the target items. This was done intentionally to ensure that the ungrammatical target items would be perceptually salient and distinct from the grammatical fillers (cf. Abdollahi D., 2022), as participants tend to experience reduced slowdown when they become accustomed to encountering ungrammatical items. All items were checked by two native speakers of Norwegian.

The grammatical and ungrammatical conditions were equated in terms of item similarity, as each participant was exposed to only one version of either list 1 or list 2, which were randomly assigned, such that no participant would see the same version of the sentence twice. Both lists can be found in the Online Repository for Data Science (link in 4.1). In total, each list contained 80 items. The presentation of stimuli within each list was randomized. Also, it made use of distractors in the form of comprehension questions. First, to ensure that cognitive processes were "engaged throughout and the participant does not end up pressing buttons without paying attention to the experimental stimuli on display" (Jegerski, 2014). Then, to avoid priming effects on the participants who may start to reflect on the task and alter their behavior (Jegerski, 2014).

The comprehension questions were 22 instead of 28, as for the already mentioned technical problems, and the answers were either "ja" (yes) or "nei" (no). None of the comprehension questions targeted the investigated properties but were rather meaning-based questions as they are shown to interfere less with the primary purpose of the task (Keating & Jegerski, 2015).

Table 8 - Examples per target stimuli.

Property	Grammatical	Ungrammatical
a. Possessive reflexives gender agreement	Edoardo/ møter/ mora/ <u>si/</u> hver/ dag/ etter/ jobb.	*Edoardo/ møter/ mora/ <u>sin/</u> hver/ dag/ etter/ jobb.
	Edoardo meet-3 mum his every day after work	Edoardo meet-3 mum his every day after work
	"Edoardo meets his mom every day after work."	"Edoardo meets his mom every day after work."

b. Topicalization	Hver/ dag/ spiser/ Tommaso/ alene/ på/ jobb. Every day eat-3 Tommaso alone at work "Every day, Tommaso eats alone at work."	*Hver/ dag/ Tommaso/ spiser/ alene/ på/ jobb. Every day Tommaso eat-3 alone at work "Every day, Tommaso eats alone at work."
c. Adverbial word order (main phrases)	Her/ er/ Giulia./ Hun/ synger/ alltid/ i/ dusjen/ etter/ jobb. Here is Giulia. She sing-3 always in shower-DEF after work "Here is Giulia. She always sings in the shower after work."	*Her/ er/ Giulia./ Hun/ alltid/ synger/ i/ dusjen/ etter/ jobb. Here is Giulia. She always sing-3 in shower-DEF after work "Here is Giulia. She always sings in the shower after work."
d. Adverbial word order (subordinate phrases)	Her/ er/ Pietro,/ som/ aldri/ går/ hjem/ i/ helgen. Here is Pietro, who never go-3 home i weekend-DEF "Here is Pietro, who never goes home for the weekend."	*Her/ er/ Pietro,/ som/ går/ aldri/ hjem/ i/ helgen. Here is Pietro, who go-3 never home i weekend-DEF "Here is Pietro, who never goes home for the weekend."

An example of filler is, instead:

Table 9 - Filler

Filler	Lorenzo skriver en melding på telefonen. Lorenzo write-3 one message on phone-DEF "Lorenzo writes a message on the phone".

To prevent undesirable pauses from the first-year Norwegian students, the items were constructed utilizing the most commonly used Norwegian vocabulary, and verbs were only used in their transitive form. Furthermore, in order to avoid gender ambiguity in the items testing possessive gender agreement (a, in Table 8), only proper names that are commonly recognized by Italian speakers were utilized in the study, e.g., Gioele (M), Elisabetta (F), Noemi (F), not Andrea (M-F).

For the same reason, it was crucial to use family members' common names as objects: *mora* (mother, F), *faren* (father, M), etc.

The experimental methodology for the SPR was developed based on the framework proposed by Jegerski (2014):

> "Once the experimental sentences have been created, they are broken down into regions of interest, which participants will read one-by-one and will each correspond to a separate data point in the form of a reading time in milliseconds (ms)."

Before starting the task, participants completed an initial survey concerning their handedness (left-handed or right-handed), in order to ensure appropriate execution of the task. Indeed, when answering the comprehension questions, the participants were instructed to position their dominant hand on the "ja"(yes) key, while situating their non-dominant hand onto the "nei"(no) key.

In this case, the expected response is "ja"(yes). If the respondent provided an incorrect answer, they would have been shown a feedback screen prompting them to be more attentive. To not let the participants predict whether "ja" or "nei" was the expected answer, eleven expected responses were "ja", and eleven expected responses were "nei".

In the present investigation, a non-cumulative presentation (Jegerski, 2014) was employed whereby the individual words were displayed at the focal point of the screen, as in Image 1.

Image 1 - Center Non-Cumulative Presentation of SPR with Word-By-Word Segmentation.

Every word is associated with a distinct *region*, and those region(s) in which an error occurs are referred to as *critical regions*. The regions that follow are commonly referred to as *spillover regions* due to their susceptibility to *spillover* effects (Rayner & Duffy, 1986; cited in Keating & Jegerski, 2015). Indeed, "In some sentence processing studies, including those conducted on monolinguals, the effect of a tested variable first appears in a spillover region, not in the target region" (Keating & Jegerski, 2015:6).

In general, participants experience increased reading times and pause duration upon detecting errors during the experiment.

Table 10 - Overview of the critical region(s) per condition.

	Property	Critical region(s)
a.	Gender agreement	R4
b.	Topicalization	R3 or R5
c.	Adv-V (main)	R5
d.	Adv-V (sub)	R5

4.2.3 Proficiency tests

Two proficiency tests were included in the study to assess the level of the participants in their L2 English and their L3 Norwegian, in addition to their self-ratings.

The Norwegian proficiency task is a shorter version of the Norwegian placement test for foreigners at UiT, the Arctic University of Norway. It consists of 36 multiple-choice items preceded by 4 practice items. An example is given in (41). Given that the participants had varying levels of education, this task was needed to gain a more comprehensive understanding of the proficiency level of each participant. The employed Norwegian proficiency test is limited to placing learners within beginners (A1), elementary (A2), and pre-intermediate (B1) levels only.

(41) Example of item

Hvor kommer dere fra? 'Where are you from'?

a. De kommer fra Spania. 'They come from Spain'

b. Dere kommer fra Spania. 'You come from Spain'

c. Vi er fra Spania. 'We are from Spain'

d. De er fra Spania. 'They are from Spain'

On the other hand, the English proficiency task consisted of more elaborate and specific exercises, since it was essential to determine each participant's English proficiency level. This task is a shortened version of the Oxford Placement Test (UCLES, 2001) and consisted of several exercises, with a total number of 67 items. Of the aforementioned items, five were aimed at gauging the participants' general English proficiency and were presented in visual format, while the remaining 30 items were incorporated into a cloze task, wherein the participants were required to meaningfully fill in the blanks in a given narrative text or sentence.

4.2.4 English forced choice task

In order to ensure that the participants had acquired the language properties examined in the study and were therefore "eligible" for transfer, they were administered a forced-choice task in English.

In this task, 16 items were utilized, with 6 items dedicated to evaluating possessive agreement and an additional 6 items designed to test Adv-V word order. The remaining (n=3) items were assigned to assess topicalization. It is noteworthy that all items featured in the study bore a resemblance to their Norwegian counterparts in the SPR task, as in (42):

(42) Example of item

Here is Giulia.

She never works from home. / She works never from home.

It was essential to test the participants' English knowledge of the target constructions implied in the SPR task. If they were not able to recognize and use these structures properly in English, it wouldn't be valid evidence for or against CLI in Norwegian.

5 Results

In this Chapter, the results of the tasks employed in the experiment are presented. It is divided into two sections. Section 5.1 presents the results of the pilot experiment, while section 5.2 presents the outcomes of the primary experiment, which are subsequently categorized into three subsections.

The subsections report on the findings of the self-paced reading task, the Norwegian and the English language proficiency tests, and the English forced choice task. All the results are subsequently analyzed in Chapter 6 and discussed in Chapter 7.

5.1 The pilot study

The pilot study was conducted for multiple purposes. First, testing whether the self-paced reading task was functioning effectively or necessitated modifications was necessary. Then, it pointed out if the chosen items were appropriate to elicit a reaction and whether the duration of the primary task was sufficient.

The pilot study was addressed to L1 Norwegian speakers residing in Norway, and a total of 10 participants joined it. Personal data was not collected for this group, as extra-linguistic effects were not expected to substantially affect responses in native speakers. The participants were recruited via word of mouth and were only required to complete the SPR task.

As a consequence of a technical error, the participants were exclusively assigned to complete list1 of the experiment, instead of the intended random allocation of list1 and list2 among the entire cohort.

To assess the degree of attention exhibited by the participants towards the task, a binary yes-no approach was employed, wherein the qualitative responses provided in response to the comprehension questions were recorded as either correct (assigned a value of 1) or incorrect (assigned a value of 0). Each of the participants involved in the pilot study (n=10) achieved a score surpassing 77% of correct responses (M=19,3; SD=1,48; range=17-22).

In general, there seems to be an effect in each of the conditions, confirming the correct functioning of the task (see Graph 1). In the graphs, the green line denotes the

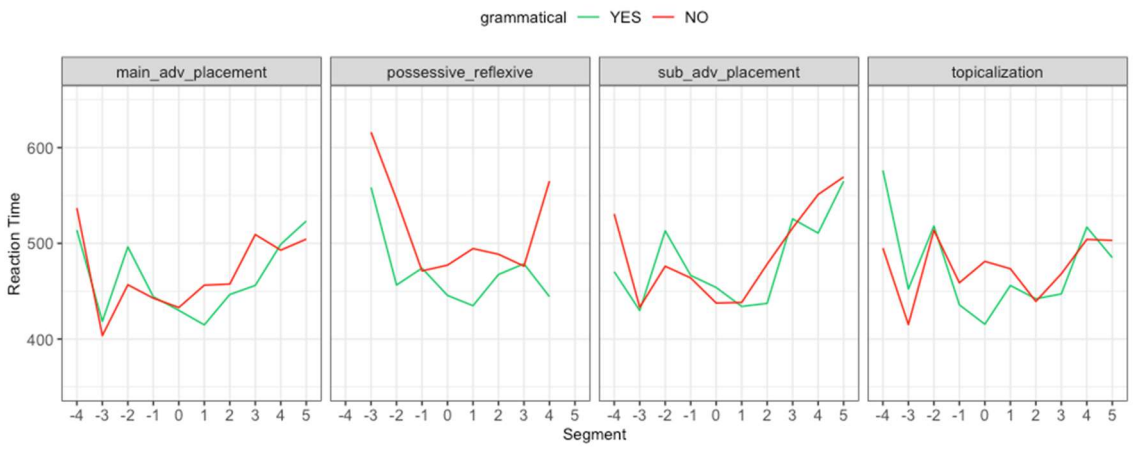
average RTs pertaining to the grammatically correct items, whereas the red line signifies the mean RTs associated with the ungrammatical version of the same item. The RTs are presented per segment, with section "0" representing the critical region of each item, followed by subsequent spillover regions. Any observed increment in RTs subsequent to the critical region within the context of ungrammatical sentences is likely to reflect processing difficulties, as it signifies an increase in response times.

To start with, the graph for the possessive gender agreement structures display a rising trend of RTs in the case of non-grammatical sentences, starting from the critical region and extending to the spillovers.

Regarding the topicalized structures categorized under the "topicalization" label in Graph 1, longer RTs are observed in the spillover region, and the most pronounced disparity is visible at the critical region.

The findings for the adverbial sentences reveal a somewhat more pronounced effect, as even if the effect size is relatively smaller, it exhibits a longer duration over the spillover regions. Specifically, in the case of "main adverb placement", a trend is observed whereby the ungrammatical sentences elicit longer RTs compared to the grammatical sentences. Similarly, the same effect is discernible in the "subordinate adverb placement" sentences, although the values appear to overlap in section "3".

Graph 1 - Mean RTs per condition and region (pilot study).



To ensure clarity, the example sentences corresponding to each condition are restated below, using the same terminology and order as used in the graphs:

- main_adv_placement: Her er Giulia. Hun synger alltid/ *alltid synger i dusjen etter jobb.
- possessive reflexive: Edoardo møter mora si/*sin hver dag etter jobb.
- sub_adv_placement: Her er Pietro, som aldri går/ *går aldri hjem i helgen.
- topicalization: Hver dag spiser Tommaso/*Tommaso spiser alene på jobb.

As from the visualization of the data, there seems to be an effect in most conditions, indicating the correct functioning of the experiment. However, because of the low number of participants included in the pilot, no statistical analysis could be done. Additionally, unexpected high values of RTs in the ungrammatical conditions are evident in the beginning section of the sentences, which may be attributed to the absence of items from list2, thereby compromising the perfect comparability of the sentences.

Although the reason for the participants' increased reading times at the onset of an ungrammatical sentence (where no grammatical violations are present in that region) remains unexplained, it is worth mentioning that this task included the utilization of Italian proper names, which may have caused gender ambiguity issues in the sentences including possessives.

5.2 The Experiment

The results of each task are reported in the following subsections, as part of the experiment including the L1 Italian, L2 English, L3 Norwegian group of participants.

5.2.1 Self-paced reading task (SPR)

Data from the SPR task consisted of reaction times (RTs) and binary yes-no qualitative responses, following the comprehension questions (n=22). It is reported whether the response of the questions was correct (1=yes), or incorrect (0=no).

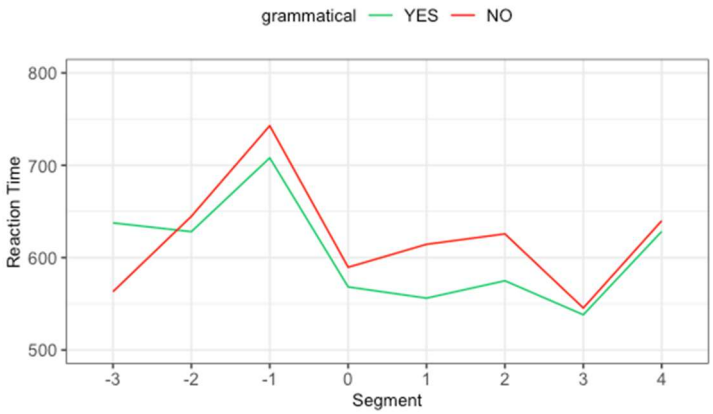
A low accuracy on the comprehension question could indicate that the participants did not understand enough of the sentences used in the experiment or were not completing the task carefully (Andresen, 2020). In light of this, the data of 3 participants was excluded from the analysis.

The rationale for exclusion was that these participants' responses to the SPR distractor questions were indicative of a lack of task focus or insufficient knowledge of

the Norwegian language to complete the exercise, as evidenced by their low scores. Indeed, inaccuracy suggests that the participant might not have been fully focused while reading the experimental sentences (Jegerski, 2014). In other words, the participants' lack of attention could result in unreliable RTs measurements, thereby rendering their inclusion unsuitable for data analysis. Among the 16 eligible participants, 16 was the lowest recorded score for the comprehension questions (M=17, SD=2,34, range=16-21).

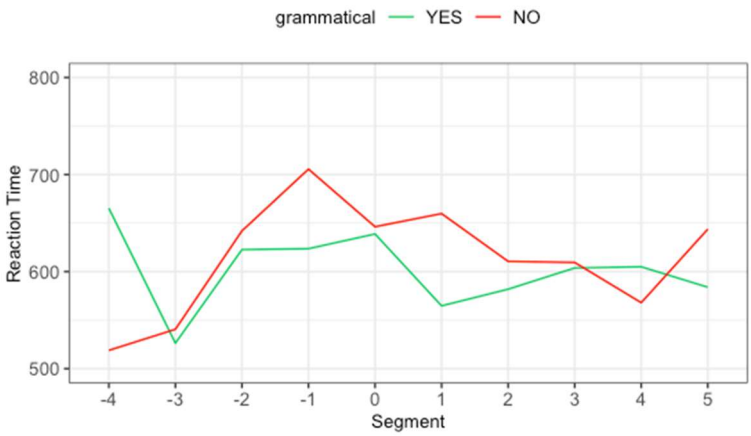
Moving on with the RTs, Graph 2 for the possessive reflexive gender agreement portrays the disparities in RTs between grammatically correct and ungrammatical sentences, spanning from the critical region 0 to 2.

Graph 2 - Mean RTs per possessive reflexive gender agreement (L1 ITA group).



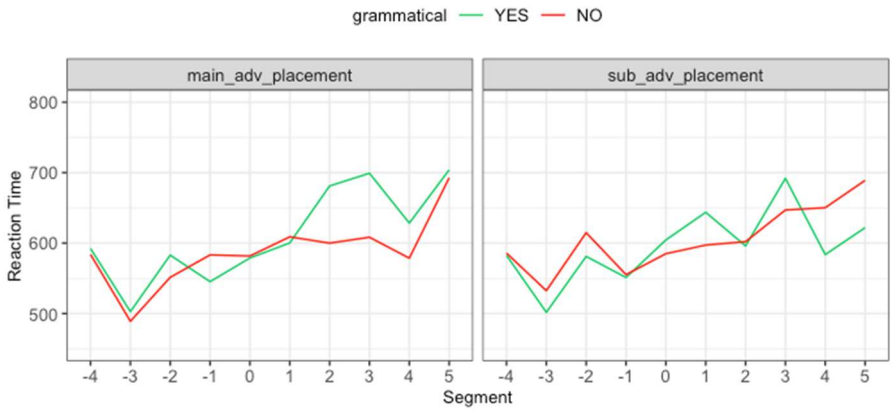
The graph denoting RTs for topicalized structures is presented below (Graph 3). No differences in RTs are visible at the critical region, but rather in section 1.

Graph 3 - Mean RTs per topicalization (L1 ITA group).



Moving on, the RTs for adverbial structures are depicted in the Graph 4 below. The left image pertains to adverbial word order in main phrases, while the right image represents adverbial word order in subordinate sentences. These graphs are presented jointly to highlight a discernible reversal in the observed trend. Significantly, participants demonstrated a deceleration when reading grammatically correct sentences in the main structures. In the instance of subordinate structures, the difference in RTs was not significant, indicating a divergence in the influence of grammaticality between main clauses and subordinate clauses.

Graph 4 - Mean RTs per adverbial word order (L1 ITA group).



To summarize, some effects were visible in the critical and subsequent regions. Furthermore, disparities in RTs were observed between grammatical and ungrammatical sentences in certain earlier regions, which was unexpected given that the two conditions, "grammatical" and "ungrammatical," are visually indistinguishable until the critical region.

However, it is plausible to attribute this effect to inherent “noise”, as for individual dissimilarities among speakers and items which could have been mitigated with a larger dataset.

5.2.2 Proficiency tests

The results of the Norwegian proficiency test indicate that participants obtained a diverse range of scores, with the highest score being 26 out of 36 possible points and the lowest score being 11 out of 36 points (M=21,12; SD=4,6; range=11-26).

The range of possible scores for the test was 1-36, and proficiency levels were assigned based on the following criteria, as in Espindola (2022): scores between 1 and 12 were classified as beginner level (A1), scores between 13 and 24 were classified as elementary level (A2), scores between 25 and 32 were classified as pre-intermediate level (B1), and scores of 33 to 36, or those exceeding 80% of the maximum possible score, were classified as intermediate level (B2).

Table 11 – Distribution of participants among CEFR levels for Norwegian.

Level	N	Range
A1	1	1-12
A2	10	13-24
B1	5	25-32

The outcomes of the English test were assessed in a comparable manner, wherein 1 point was assigned for each accurate response and 0 points were allocated for incorrect answers. The score range for the English proficiency test was 37-56, with a mean score of 48,8 and a standard deviation of 6,3.

However, due to the lack of a standardized approach to grouping proficiency levels for this particular version of the Oxford placement test participants were not classified according to the CEFR (2001) scale. Moreover, the individual scores for the English and Norwegian proficiency test are used as predictors for analysis of the SPR task, and therefore it was not deemed necessary to categorize them into groups.

5.2.3 English forced choice task

The English forced choice task findings indicate that the participants were familiar with the constructions examined in the Norwegian self-paced reading task. Indeed, participants demonstrated a proficient understanding of these constructions in English, as evidenced by their ability to identify incorrect constructions accurately.

The task comprised a total of 15 items, each of which was scored as either correct (scored as "1") or incorrect (scored as "0"). The maximum attainable score was 15, a score that was achieved by a majority of participants (M = 14.68; SD = 0,58).

As outlined in section 4.3.3, the English forced choice task included a total of 6 sentences designed to examine the participants' knowledge of post-nominal possessive constructions, an additional 6 sentences targeting adverbial word order (3 in main clauses and 3 in subordinate clauses), and 3 sentences specifically assessing knowledge of word order in topicalized structures. It was observed that four errors occurred due to three participants selecting an incorrect gender agreement construction. Moreover, two participants each committed one and two errors, respectively, specifically pertaining to the adverbial word order in subordinate clauses. Nevertheless, participants exhibited proficiency in accurately identifying the appropriate construction for each of the analyzed structures.

5.3 Summary of the results

This chapter reported on the experiment results, which involved four tasks: the self-paced reading task (SPR), the Norwegian proficiency task, the English proficiency task, and the English forced choice task.

The SPR task data was analyzed for accuracy and reaction times, and three participants were excluded due to low accuracy scores on the comprehension questions. The analysis of the SPR task results is reported in the following chapter 6.

The results of the Norwegian proficiency test exhibited a wide range of scores, with participants distributed across various proficiency levels ranging from A1 to B1, while the results of the English proficiency test demonstrated a similarity in performance among the participants, aligning with their self-reported proficiency levels.

Finally, the outcomes of the English forced choice task revealed that participants demonstrated a proficient understanding of the structures under examination, namely possessive gender agreement, adverbial word order in both main and subordinate clauses, and word order for topicalized structures.

6 Analysis

The data are available on (https://osf.io/, link in 4.1) and were analyzed using linear mixed-effect models (Baayen et al., 2008) using the lme4 package (Bates, 2005) in R Core Team (2021).

More detailed information about the analysis procedure for each category is included in the following subsections.

6.1 Self-paced reading (SPR) task

To facilitate the analysis of the SPR task, a re-coding process was conducted for each segment of the word-by-word segmentation, whereby its position within the sentence was reassigned relative to the critical section of that particular sentence.

Table 12 - Example of item and its regions.

Hver/ dag/ **spiser**/ **Tommaso**/ alene/ på/ jobb.

*Hver/ dag/ **Tommaso/ spiser**/ alene/ på/ jobb.

R1	R2	**R3**	**R4**	R5	R6	R7
r-2	r-1	**r**	**r+1**	r+2	r+3	r+4

Note: the words in bold are considered critical regions.

Since SPR effects tend to overflow, or "spill-over" after the critical word/region (Wagers et al., 2009; Jegerski, 2014; Parker and Phillips, 2016; Lago et al., 2018), the data was filtered to include only sentences from sections 0-5, where 0 represents the critical region. Regions +5 words from the critical region were analyzed to account for spillover and wrap-up effects.

Empirical investigations examining reading times have consistently demonstrated that individuals tend to allocate more time to the final word of a sentence or clause (Meister et al., 2022), a phenomenon commonly referred to as the *wrap-up* effect (Rayner et al., 2000; Camblin et al., 2007). However, despite its prevalence, a comprehensive understanding of this phenomenon is still lacking, as many studies "exclude data from these words to explicitly control for the confounding factors introduced by wrap-up effects" (Meister et al., 2022:20).

In this particular study, we posit that while it is acknowledged that sentence- or clause-final words are linked to increased reading times in self-paced reading investigations (Meister et al., 2022), the wrap-up effect may entail attempts to resolve previously postponed comprehension difficulties (Rayner et al., 2000), and therefore, it should not be disregarded (Stowe et al., 2008). Given the constraints imposed in this study, wherein participants were unable to review previous portions of the sentence, it is suggested that readers might allocate extra time to ensure the presence or absence of inconsistencies in the preceding text (cf. Jarvella, 1971). Hence, to account for this consideration, the final region of each sentence has been incorporated into the analyses.

Following previous self-paced reading studies, RTs faster than 200 ms or slower than 6000 ms were excluded from the analysis. Indeed, extremely low RTs "are presumably erroneous, uninformative, and therefore can reasonably be deleted" (Jegerski, 2014). As lexical retrieval typically exceeds the 200 ms threshold, it was deemed implausible for participants to have adequately processed the word at such rapid reading times (Jegerski, 2014; Staub, 2010; Andresen, 2020). On the other hand, extremely high values could possibly indicate genuine processing challenges (Jegerski, 2014); hence it was deemed appropriate to set a maximum value of 6000 ms. All the RTs were transformed using the log function as in previous research (Winter, 2020) and set as a dependent variable. The logarithm transformation is used to "make highly skewed distributions less skewed and closer to normally distributed" (Andresen, 2020:30) and to ensure normality of the distribution.

RTs were analyzed for sentences in four different categories: (i) possessive gender agreement, adverb word order in main (ii) and subordinate (iii) clauses, and (iv) topicalization. Then, treatment coding was operated to deal with the independent variables (grammaticality). Every model includes random intercept for subject (cf. Andresen, 2020), which refers to their mean reaction time on grammatical sentences, and random slopes for grammaticality, namely the degree of difference between grammatical and ungrammatical.

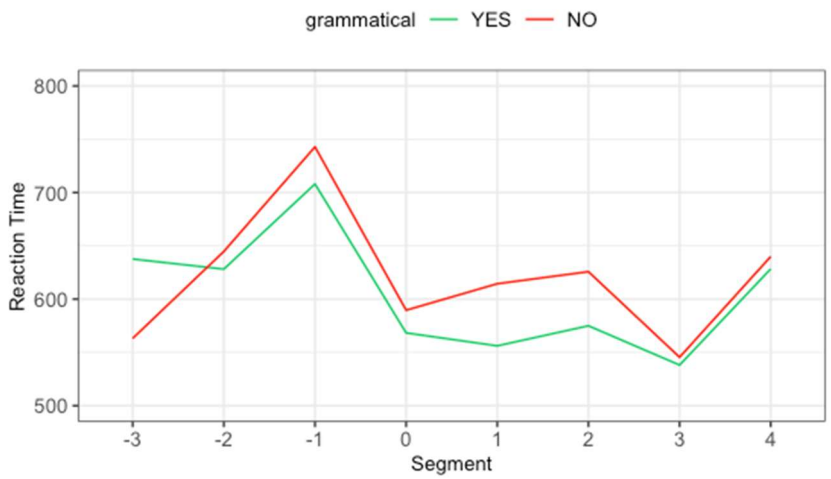
The statistical analyses for the four different conditions were performed in two stages. Initially, a preliminary model was employed to examine the impact of grammaticality on reading times. Then, the extralinguistic variables were added one by one to the analysis. All the extra-linguistic variables having to do with English and

Norwegian, such as length of use, self-rated proficiency, and self-rated usage, were included in the model as interactions with the "grammatical" variable in order to assess their potential influence on error sensitivity. Additionally, the results of the language proficiency tests were incorporated into the analyses at this stage.

6.1.1 Possessive gender agreement

For the possessive gender agreement sentences, the initial analysis showed that the effect of grammaticality was not significant on RTs (estimate 0.03646, t=0.977, p=0.344). This suggests that the participants were not sensitive to the errors in these regions (0-5), but there seems to be a trend in regions 1 and 2 showing an increase of RTs in the occurrence of an ungrammatical sentence (see Graph 2 below).

Graph 2 from the Results section (5.2.1) is repeated here for clarity.

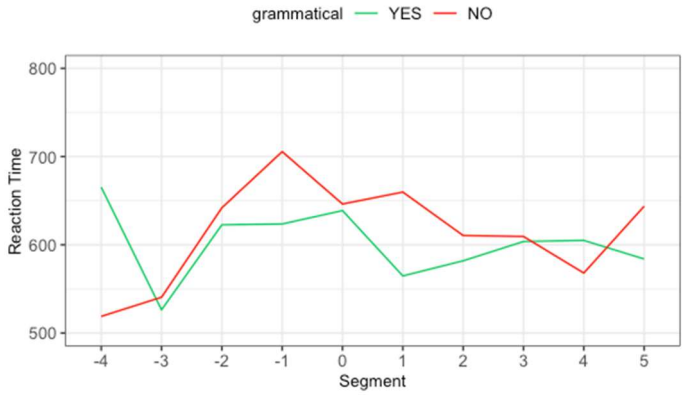


To further explore this issue, extralinguistic variables were added one by one to the model. All variables related to English were included as interactions with grammaticality to see whether there was an effect of any of these on the sensitivity to errors. However, none of these interactions were significant. Moreover, none of the measures related to Norwegian showed a significant effect either.

6.1.2 Topicalization

The initial analysis for topicalized structures revealed that grammaticality's effect on RTs was insignificant. This suggests that the participants were not sensitive to the errors in this region.

Graph 3 from the Results section (5.2.1) is repeated here for clarity.



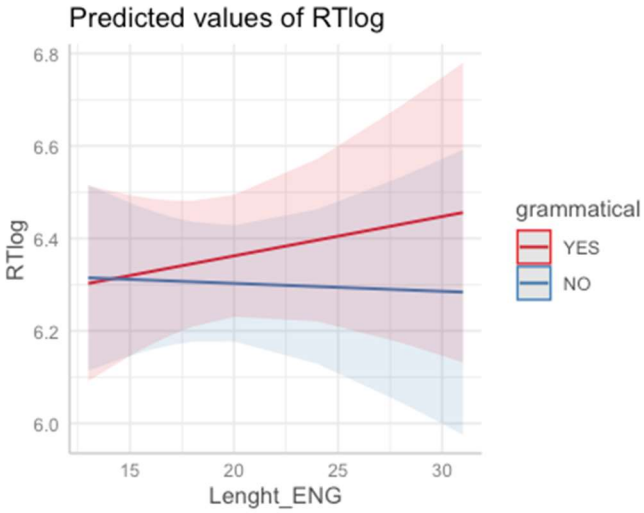
Subsequently, extralinguistic variables were incorporated into the model one by one. The model also examined the potential impact of English-related variables by incorporating them as interactions with the variable "grammatical". However, none of these variables were found to have a significant impact on error sensitivity. Similarly, measures related to Norwegian did not yield any significant findings. In sum, the addition of extralinguistic variables, including English-related variables and measures related to Norwegian, did not result in any significant impact on error sensitivity in the model.

6.1.3 Adverbial word order

Main clauses with adverbs were analyzed, and it was found that there was a marginally significant main effect of grammaticality (t=-1.801, p=0.0919) on RTs. Participants took longer to read sentences with correct adverb placement than those with incorrect placement. Then, the extra-linguistic variables were separately added to the model. The only reported significant variable was the one concerning the length of the English studies (estimate=0.008511, t=0.650, p=0.5268), meaning that participants that spent a

more extended amount of time formally studying the language would exhibit less target-like behavior in Norwegian (see Graph 5).

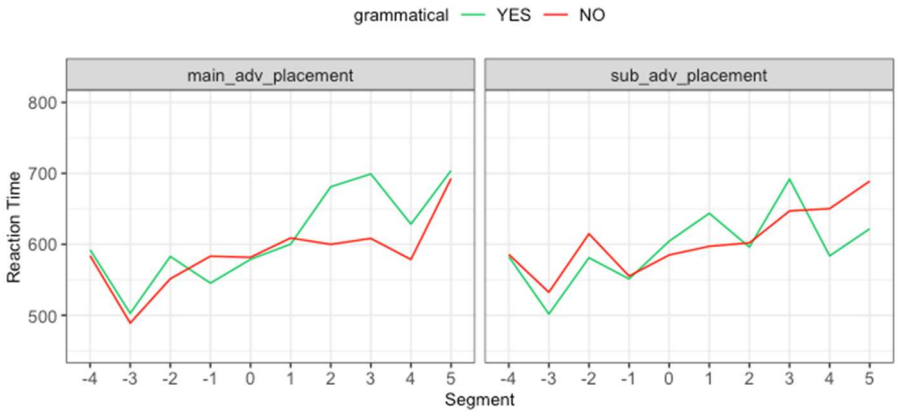
Graph 5 – Linear mixed effect model per RTs and Length of English studies.



Then, subclauses with adverbs were analyzed, which revealed the absence of a significant primary effect of grammaticality on RTs. Similar to the previous analysis, all extralinguistic variables were subsequently incorporated into the model individually, yet none of these variables demonstrated significance in relation to grammaticality. Indeed, further analysis did not reveal any significant effect of these variables on the processing difficulty of subclauses with adverbs.

Ultimately, as the graphical representation for each adverbial construction showed a different effect (Graph 4) on RTs for grammatical and ungrammatical sentences, a comparison was made between them, especially as the predictions for CLI are different based on the overlap with Italian (main sentences) and English (subordinate sentences). The main effect of grammaticality was marginally significant (estimate=-0.05290, t=-1.935, p=0.0634), suggesting that participants took longer to read sentences with ungrammatical adverb placement compared to grammatically correct ones. The main effect of clause type was not significant (estimate=-0.02232, t=-1.155, p=0.2482), indicating that there was no significant difference in reading times between sub clauses and main clauses.

Graph 4 from the Results section (5.2.1) is repeated here for clarity.



However, the interaction between grammaticality and clause type was significant (estimate=0.05785, t=2.114, p=0.0346), indicating that sensitivity to adverb placement errors was stronger for subclauses than for main clauses. Specifically, participants took longer to read sentences with grammatically correct adverb placement in main clauses compared to those with ungrammatical placement, while the opposite was true for subclauses.

In brief, although no statistically significant distinction was identified between grammatical and ungrammatical conditions, the extralinguistic variable “length of English studies” exhibited significant effects, indicating that a longer duration of English language studies lead to increased non-facilitative influence from English.

6.1.4 Summary of the analysis

This study analyzed different grammatical structures and extralinguistic variables for their effect on participants' RTs in an SPR task. The statistical analysis was conducted in two stages, first looking at RTs and grammaticality and then incorporating into the model all extra-linguistic variables related to English and Norwegian, individually, as interactions with the variable "grammaticality" to explore potential effects on error sensitivity.

Grammatical violations in possessive gender agreement sentences were found to be unnoticed by participants. Similarly, errors in topicalized structures were not detected by participants. However, for sentences containing adverbs, the analysis revealed a significant interaction between grammaticality and clause type. This indicated that participants took longer to read sentences with grammatically correct adverb placement

in main clauses compared to those with ungrammatical placement, while the reverse was observed for subclauses. This finding was supported by the graphical representation of the data, which demonstrated a reversed effect between main clauses and subclauses.

The inclusion of extralinguistic variables, such as English and Norwegian related variables did not yield significant effects on error sensitivity in the models for possessive gender agreement and topicalization. However, for main adverb clauses, the extralinguistic factor of "length of English studies" emerged as a significant predictor. Participants with a longer duration of English studies exhibited a less target-like behavior, and therefore non-facilitative CLI from English.

7 Discussion

As previously presented (see section 3.2), this study addressed three main research questions in relation to a group of Italian native learners of Norwegian (L3), with English as their L2:

RQ1: Is there a transfer from L2 English?

RQ2: What is the nature of the transfer from L2 English? Is it facilitative, non-facilitative, or both?
RQ3: Do extralinguistic variables in English modulate the degree of transfer?

In this Chapter, the insights obtained from the previous analyses of the research data (Chapters 5 and 6) are discussed in the light of the theoretical background provided in Chapter 2.

Specifically, this chapter serves to discuss the findings of the study in greater detail and to compare them to existing findings.

7.1 General discussion

Drawing from prior research on L3 acquisition, the present study hypothesized that transfer from L2 English is likely to occur between English and Norwegian (L3) as they share some typological similarities (H1) and that such transfer may be beneficial or not (H2). The study also focused on extra-linguistic variables, specifically English proficiency, and language usage, which have been shown in previous research (Bardel & Falk, 2012; Faldet Listhaug et al., 2021; Dahl et al., 2022) to affect transfer from L2. As such, the study hypothesized (H3) that higher English proficiency may not necessarily result in more transfer, while greater L2 input (e.g., length of exposure to English) may have a more significant impact.

The Norwegian native speakers who participated in the pilot of this study exhibited some differences in their RTs between the reading of grammatical and ungrammatical sentences, despite not being overly obvious. Therefore, their results suggest that the experiment worked adequately, although more data is needed to confirm these claims. To summarize, the response of native speakers to grammatical violations in the investigated properties manifested in slower RTs beyond the critical region of the ungrammatical sentence. Additionally, specific unexpected effects were observed in the initial segment of the sentences for all categories, which could potentially be attributed to the utilization of only one list of the experiment instead of the intended random allocation of *list1* and *list2* due to a technical error.

The results of the SPR task for the Italian native speakers indicated that, while there were numerical differences in RTs between grammatical and ungrammatical sentences across all properties, only the main adverbial phrases showed statistically significant differences. No significant processing costs were observed for the possessive agreement and topicalization mismatch items. Regarding the Italian native speakers, the discussion for each of the investigated structures is reported below, summarized by Table 5 which is reported again below for further clarity.

Table 5

	Italian	English	Norwegian
Possessum gender agreement	✓	X	✓
V2	X	X	✓
V-Adv main	✓	X	✓
V-Adv sub	✓	X	X

For the possessive gender agreement structures, Italian shares similarities with Norwegian, as both languages present post-nominal gender agreement with the possessum, while English does not. Therefore, in relation to English, it was predicted that some non-facilitative effect could be manifested in English low proficient participants or those who reported a considerable amount of English use and exposure, both in terms of instruction and on a daily basis.

The analyses showed that participants were not significantly sensitive to errors in the crucial regions of the sentences, but they rather exhibited a similar trend in the reading of both grammatical and ungrammatical structures. In this case, influence from English would be non-facilitative. Consequently, CLI from English would result in a diminished sensitivity to error detection, which would manifest in a decreased disparity in RTs, thereby confirming the observed outcome.

Italian, on the other hand, would have exerted a positive transfer enhancing the sensitivity to error detection, but this effect was not observed.

Furthermore, it is worth mentioning that reduced sensitivity to the errors might also be attributed to low L3 proficiency, even if none of the Norwegian or English extra linguistic variables were found to have an impact on error sensitivity. By increasing the participant sample size, it is possible that certain effects related to L3 proficiency could

become more discernible. Previous research conducted by Angelovska et al. (2020) has established L2 dominance as a critical factor influencing the accuracy performance of low-proficient L3 learners. Furthermore, Stadt et al. (2020) have provided evidence indicating a correlation between increased L2 input and enhanced L2 transfer. Based on these findings, it was hypothesized in this study that a high level of English proficiency would not necessarily lead to increased transfer. Instead, an effect of transfer would be visible in participants with greater exposure to English input and more dominance.

As for the topicalized structures, Norwegian does not share similarities neither with Italian nor English, as Norwegian is the only V3 language among those investigated in this study. For both Italian and English, CLI would lead to reduced sensitivity to the errors, and therefore to a reduced difference between RTs. The initial analysis showed that participants did not significantly slow down when reading ungrammatical structures in respect to grammatical ones. Which means that negative transfer was possible from either English or Italian, or it could still be an effect of low Norwegian proficiency. On the other hand, it looks like they increased their RTs in the initial part of the sentences, before the critical regions, but we are lacking information about this behavior. Additionally, none of the Norwegian or English extra linguistic variables were found to have an impact on error sensitivity.

For the adverbial phrases, the study included the use of both main and subordinate sentences, as Norwegian overlaps, in terms of word order, with Italian and English respectively. In main clauses, $L1_{ITA} = L3_{NOR} \neq L2_{ENG}$; while in subordinate clauses, $L1_{ITA} \neq L2_{ENG} = L3_{NOR}$ (from Table 5).

The expected pattern for main clauses, in relation to English, was that if transfer from English would occur, participants would not notice the grammatical violations in main phrases, resulting in a lack of slowed down RTs. Conversely, CLI from Italian was predicted to assist the participants in identifying the grammatical violations. However, contrary to expectations, participants exhibited more pronounced deceleration in RTs for the grammatical sentence. Subsequently, CLI from English was then confirmed by the RTs results and the analysis, which revealed a significant interaction between "grammaticality" and "clause type". This indicates that participants displayed considerably slower RTs when reading a grammatical sentence in the context of main

clauses. Since Italian and Norwegian overlap in that condition, the most plausible reason they would slow down is because it is ungrammatical in their L2 English.

Following the incorporation of extralinguistic variables into the analysis, it was reported that participants who had been studying English for a longer amount of time demonstrated a higher degree of CLI in relation to Norwegian.

Among the models predicting for wholesale transfer, the L1 Factor model (Hermas, 2014), Italian would be the predominant source of CLI in L3A. Nevertheless, the findings of this study do not support the claims of this model as the observed cross-linguistic influence was not exclusively restricted to Italian. However, it is not possible to validate the L2 Status Factor model (Bardel & Falk, 2007; Falk & Bardel, 2011) either, given that the experimental design does not allow for the isolation of solely the effects of L2 English.

The CEM model, as proposed by Flynn et al. (2004), posits that transfer in multilingual acquisition can manifest in either a facilitative or neutral manner, from either or both the previously acquired languages. As the results showed non-facilitative transfer from English (cf. Rothman & Cabrelli Amaro, 2010), they do not support Fynn et al. 's model (2004).

According to the Scalpel Model (Slabakova, 2017), the participants in this study were predicted to experience either facilitative or detrimental transfer from their prior knowledge of English, which possesses typological similarities to the target language, Norwegian, as both languages are members of the Germanic language family. Since transfer was not exclusively facilitative, the Scalpel Model, as proposed by Slabakova (2017), is not falsifiable by the results of this study. However, since the participants were not assessed during the initial stage(s), the model also cannot be verified.

The LPM (Westergaard et al., 2017; Westergaard, 2019) proposes incremental property-by-property learning based on “similarities between the languages”, meaning “similarity of abstract linguistic properties” (Westergaard et al., 2017:12). Furthermore, this model allows for both facilitative and non-facilitative influence from one or both of the previously acquired languages. Given the premises, this study might present some evidence in accordance with the LPM (Westergaard et al., 2017; Westergaard, 2019).

However, as the study only included a single group methodology (cf. Westergaard et al., 2022), these claims cannot be made with certainty.

The TPM model (Rothman, 2010, 2011, 2015) mainly refers to initial-stage learners and does not make predictions for later stages of acquisition and was therefore not accounted for hypotheses.

Taken together, these findings provide support for transfer from the L2, which was modulated by participants' degree of length of studies, as it was the only extra-linguistic variable to emerge as statistically. This implies that the length of time spent studying English impacted their RTs, which led to non-facilitative transfer from English in the adverbial structures. Notably, the lack of significance observed between English proficiency and grammaticality may be attributed to the fact that all participants in the experiment possessed similar levels of English proficiency, as evidenced by their comparable scores on the short Oxford placement test. By increasing the participant pool and incorporating greater diversity in L2 proficiency levels, usage, and dominance, it becomes plausible to provide more comprehensive findings and insights concerning the influence of language dominance and L2 proficiency on the acquisition of L3/Ln languages in non-initial stages.

7.2 Limitations of the present study and future research

A number of limitations are acknowledged in this final paragraph. First, the sample size for both the pilot (n=10) and the main experiment (n=16) is small. Especially considering the inclusion of non-categorical variables such as language dominance and length of language studies, the sample is not big enough (cf. Gonzalez Alonso et al., 2021). For this reason, future research should aim at examining larger cohorts of speakers with a more diverse L2 proficiency and language use.

The difficulty of finding enough L1 Italian, L2 English, and L3 Norwegian participants reflected on the lack of control group(s) due to unusual language pairs.

Future research may also address L1 speakers residing in Norway who maintain the same language pair, L2 English and L3 Norwegian, as it could help isolate the effects of language dominance.

Collaborating with educational institutes is recommended to ensure Norwegian vocabulary training takes place before students participate in the linguistic tasks. For this study, it was assumed that all participants knew the words in the experiment, as they were fairly common. However, assessing the learners' knowledge of the words used in the experiment could lead to much more precise results as it would eliminate this concern.

None of the participants included in the analyses reported daily and proficient use of additional L3s. However, grouping the participants by additional L3s and administering them specific proficiency tasks could improve the design of the experiment at the level of used structures.

As for the experiment, several technical errors occurred. Some items were not administered to the participants, who thus encountered 80 items instead of 86. Similarly, only 22 comprehension questions were included in the results instead of the actual number (n=28). If the study is repeated, it is necessary to ensure all elements are present and balanced in the experiment.

8 Conclusion

The present study aimed to investigate the role of English as a second language (L2) on the acquisition of L3 Norwegian by L1 Italian speakers. The research questions focused on the nature of cross-linguistic influence (CLI) from L2 English to L3 Norwegian, as well as considering the potential effects of extra-linguistic variables such as L2 proficiency and use.

The findings indicated that participants exhibited non-target-like behavior in processing adverbial phrases in both main and subordinate clauses, suggesting CLI from English.

This was supported by the observed RTs delays in the presence of correct word order. The analysis revealed a significant correlation between the length of English instruction and the manifestation of this behavior, suggesting that increased exposure to English may increase the effects of CLI in Norwegian (L3).

As for the topicalized structures, it was debated that the participants' reduced sensitivity to errors might be attributed to either negative transfer from English or Italian, or even low Norwegian proficiency. The participants exhibited a lack of awareness regarding the grammatical violations in the gender agreement structures, which could potentially be attributed to non-facilitative transfer from English. While it was expected that transfer from Italian would facilitate the detection of errors, this expectation was not met.

Extra-linguistic variables, such as L2 proficiency level and length of English studies, did not significantly correlate with participants' ability to discern grammatical violations in the gender agreement and topicalization's items. None of the extra linguistic variables related to Norwegian were significant either. However, it is recommended that the influence of the participants' limited language proficiency be taken into consideration, suggesting the inclusion of a larger sample size in future research.

Ultimately, this study does not support any of the L3A models; however, with a redesign, it could potentially yield more empirical support for the LMP model (Westergaard et al., 2017; Westergaard, 2019).

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Appendices

Appendix A: Norwegian proficiency test

1. Hvor kommer dere fra?
   a. De kommer fra Spania.
   b. Dere kommer fra Spania.
   c. Vi er fra Spania.
   d. De er fra Spania.

2. Hvordan går det?
   a. Med buss.
   b. Bare bra.
   c. Jeg går på ski.
   d. Det går klokka 8.

3. Jeg elsker _____ mat.
   a. laget
   b. lage
   c. lager
   d. å lage

4. Unnskyld, kan du __ meg litt?
   a. hjelper
   b. hjelpe
   c. å hjelpe
   d. hjelp

5. Vil du __ litt kaffe?
   a. ha
   b. få
   c. lyst på
   d. med meg

6. Vi trenger åtte ___ .
   a. stolen.
   b. stoler.
   c. en stol.
   d. stolene.

7. Når kommer han tilbake?
   a. I morgen.
   b. I morges.
   c. Sist fredag.
   d. I går.

8. Han er litt ___ gammel for meg.
   a. for

b. til
c. på
d. to

9. ___ dag er det i dag?
   a. Hvilken
   b. Hva
   c. Hvordan
   d. Hvilke

10. Jeg vet ikke ____
    a. om.
    b. når biblioteket åpner.
    c. dem
    d. hvor bor han.

11. I dag ___ .
    a. det er mandag
    b. er mandag
    c. må jeg være hjemme.
    d. jeg er syk.

12. Vi reiser til India ___ .
    a. om to dager.
    b. i to dager.
    c. for to dager siden.
    d. før to dager.

13. Når ___ du stå opp?
    a. skal
    b. pleier
    c. vekker
    d. vil

14. ___ du å hjelpe meg litt?
    a. huske
    b. har lyst på
    c. kunne
    d. orker

15. Hvor skal vi ___ kjøleskapet?
    a. sette
    b. ligge
    c. stå
    d. sitte

16. Hun vil sitte __ siden av ham.
    a. i
    b. på
    c. ved

d. til

17. Hvor er brillene?
    a. Denne ligge i bokhylla.
    b. Det ligger i bokhylla.
    c. Den ligger i bokhylla.
    d. De ligger i bokhylla.

18. Hva heter ___ Anna?
    a. mora av
    b. mor fra
    c. mora til
    d. mor av

19. Hun har en bror ___ bor i Oslo.
    a. som
    b. hvem
    c. at
    d. hvis

20. Det er fest __ Ole i helga.
    a. hos
    b. til
    c. på
    d. i

21. Jeg vil ha en __ ballong.
    a. gult
    b. gull
    c. gule
    d. gul

22. Dusjer du alltid __ .
    a. i morges?
    b. i morgen?
    c. om morgenen?
    d. i morgen tidlig?

23. Jeg gleder __ til å se deg igjen.
    a. min
    b. seg
    c. deg
    d. meg

24. Jeg __ sint hvis du gjør det igjen.
    a. er
    b. blir
    c. synes
    d. skal

25. Du spiser alltid så __.
    a. rask
    b. raskt
    c. raske
    d. raskere

26. Hva __ du i går?
    a. gjør
    b. gjøre
    c. gjorde
    d. har gjort

27. Jeg __ så vondt i hodet.
    a. var
    b. gjorde
    c. følte
    d. hadde

28. Drømmer du __ å bli advokat?
    a. av
    b. om
    c. at
    d. som

29. Du er mye flinkere __ meg.
    a. enn
    b. som
    c. da
    d. den

30. Jeg skal ikke på jobb i dag.
    a. Jeg heller.
    b. Jeg også.
    c. Ikke jeg heller.
    d. Ikke jeg også.

31. Han sa at han __ litke maten.
    a. har
    b. ikke
    c. fordi
    d. hvorfor

32. Da han kom, __ for å spise.
    a. etterpå
    b. vi dro
    c. dro vi
    d. ville han

33. Hun __ kastet ut.
    a. har

b. ble
c. snart
d. ville

34. Jeg er __ hjemme.
a. mens
b. midt i
c. som regel
d. de eneste

35. Hun prøvde __ ham.
a. å skylde
b. å forsvinne
c. å unngå
d. å spandere

36. Hun likte den __ bilen.
a. hennes
b. sin
c. nye
d. ny