



UiT The Arctic University of Norway

Faculty of Humanities, Social Sciences and Education

Cross-linguistic influence in adult multilingualism

The acquisition of L3 Norwegian morphosyntax by L1 Spanish - L2 English speakers

Augusto Espindola

Master's thesis in English Linguistics, ENG-3991, May 2022

Cross-linguistic influence in adult multilingualism

The acquisition of L3 Norwegian morphosyntax by L1 Spanish - L2 English speakers

Thesis submitted by:

Augusto Velloso dos Santos Espindola

Master of Philosophy in English Linguistics

Faculty of Humanities, Social Science and Education

The Arctic University of Norway, Tromsø

Supervised by:

Prof. Dr. Natalia Mitrofanova

Department of Language and Culture

The Arctic University of Norway, Tromsø

Co-supervised by:

Dr. Brechje van Osch

Department of Language and Culture

The Arctic University of Norway, Tromsø

Acknowledgements

First and foremost, I would like to express my gratitude and appreciation to my thesis supervisor Prof. Dr. Natalia Mitrofanova and co-supervisor Dr. Brechje van Osch for their patience, valuable support and constructive feedback throughout my writing process. I thank Prof. Dr. Bjørn Lundquist and Dr. Sergey Minor for their invaluable help on statistical models, and express my sincere appreciation to Prof. Dr. Yulia Rodina, whose great lectures introduced me to the formal studies of multilingualism.

I am equally grateful to my dear friends Michael Jupiter and Thomas Kjaerstad for consulting the linguistic material used for this study and to the Institute of Language and Culture (ISK, Institutt for språk og kultur) and the Acqva Aurora Lab. for supporting my research. In addition, I send my regards to the university professors and staff at The Arctic University of Norway (UiT), The Norwegian University of Technology and Science (NTNU), and the University of Bergen (UiB) who helped me distribute the project's invitation with fellow international students. I would also like to express my heartfelt gratitude to all participants, who kindly took their time to join the study.

Last, but certainly not least, I attempt to simplify with words my deepest gratitude to my mother, Tatiana, whose without unconditional support, I would have never been given the chance to start this amazing journey. To her, I dedicate all my accomplishments.

Abstract

The current thesis investigated the topic of cross-linguistic influence (CLI) at three different developmental stages of adult third language (L3) acquisition of Norwegian by sequential first language (L1) Spanish – second language (L2) English speakers ($n = 18$). Using a mixed methods approach consisting of a grammaticality judgment task and a closed-ended questionnaire on linguistic proximity, the study tested the acquisition of four Norwegian morphosyntactic properties: (i) post-nominal possessives gender agreement, (ii) number concord on definite articles, (iii) adjective placement, and (iv) subject pronoun expression (SPE). Based on the subtracted language groups experimental design (Westergaard et al., forthcoming), L3 learners' performance was compared to the ones of Spanish ($n = 5$) and English ($n = 13$) L2 learners of Norwegian. The study also counted with a native group ($n = 15$). Predictions were grounded on five main L3A models, all which diverge in terms of the source (L1, L2, or both) and nature (holistic or property-by-property) of CLI. Altogether, results were consistent with the L1 Factor (Hermas, 2010, 2014), as findings indicated L3 learners' performance was solely influenced by their L1 Spanish, whereas both the linguistic proximity and psychotypology were overridden. In two of the conditions, the L1 Spanish groups performed significantly different from the L1 English group, having outperformed the latter in the treatment of possessives gender agreement, indicating facilitative CLI from L1 Spanish, and being outperformed by the same in the judgement of SPE sentences, indicating non-facilitative CLI from L1 Spanish. On the other two conditions, all learning groups performed alike, showing overall either high or low rates of accuracy. These last findings suggested the linguistic complexity and frequency of input of individual properties to be an important triggering factor of CLI. Finally, the L3 proficiency level was found to be a strong factor in CLI, as transfer effects were observed to be more salient at beginner (A1) and elementary (A2) L3 proficiency stages as compared to the pre-intermediate (B1) level.

Key words: Multilingualism; Third language acquisition; Cross-linguistic influence; holistic transfer; property-by-property transfer.

Table of Contents

1	Introduction	1
2	Theoretical background.....	3
2.1	Cross-linguistic influence	3
2.2	Third language acquisition	4
2.3	Influential factors in L3A CLI.....	5
2.3.1	(Psycho)Typological proximity.....	5
2.3.2	L2 and L3 proficiency levels.....	6
2.3.3	Linguistic property acquisition difficulty.....	7
2.4	Models of CLI in L3A	7
2.4.1	Wholesale transfer models	7
2.4.2	Partial transfer models.....	10
3	The scope of the present study	13
3.1	Nominal possessives agreement: cross-linguistic variation	14
3.1.1	Possessives agreement in English	14
3.1.2	Nominal possessives agreement in Norwegian	16
3.1.3	Nominal possessives agreement in Spanish	21
	Summary of the nominal possessives agreement property	24
3.2	Number concord: cross-linguistic variation	25
3.2.1	Number concord in English.....	25
3.2.2	Number concord in Norwegian	26
3.2.3	Number concord in Spanish	27
	Summary of the number concord property	28
3.3	Adjective placement: cross-linguistic variation	29
3.3.1	Adjective placement in English.....	30
3.3.2	Adjective placement in Norwegian	30
3.3.3	Adjective placement in Spanish	30

Summary of the adjective placement property.....	32
3.4 Subject pronoun expression: cross-linguistic variation.....	32
3.4.1 Subject pronoun expression in English.....	33
3.4.2 Subject pronoun expression in Norwegian.....	34
3.4.3 Subject pronoun expression in Spanish.....	35
Summary of the subject pronoun expression property.....	36
4 The present study.....	37
4.1 Research questions and predictions.....	37
5 Methods and procedures.....	41
5.1 Methodological approach.....	41
5.2 Experimental tasks.....	42
5.2.1 Background questionnaire.....	43
5.2.2 Grammaticality judgement task (GJT).....	43
5.2.3 Closed-ended questionnaire.....	48
5.2.4 Proficiency tests.....	49
5.3 The pilot study.....	51
5.4 The main experiment.....	52
5.4.1 Participants.....	52
5.4.2 Procedure.....	54
6 Results.....	56
6.1 The background questionnaire.....	56
6.2 The proficiency tests.....	57
6.3 The grammaticality judgment task (GJT).....	59
6.3.1 Results by property.....	62
Summary of the GJT results.....	71
6.4 The closed-ended questionnaire.....	72
6.4.1 Psychotypical proximity.....	72

6.4.2	Structural proximity	75
	Summary of the closed-ended questionnaire results	88
7	Analysis and discussion	89
7.1	The source and nature of CLI in adult L3A.....	89
7.2	Triggering factors of CLI in L3A	94
8	Conclusion.....	97
	Limitations and directions for future research	99
	References	101
	Appendices	111
	Appendix 1: Background questionnaire	111
	Appendix 2: Grammaticality judgment task (GJT) items	113
	Appendix 3: Closed-ended questionnaire	119
	Appendix 4: Proficiency tests	121
	A. Norwegian proficiency test	121
	B. The Standardized Oxford Proficiency test.....	125
	Appendix 5: Participants background information	128
	Appendix 6: Statistics on background data	130
	Appendix 7: Statistics on Norwegian proficiency test data	132
	Appendix 8: Statistics on the grammaticality judgement task (non-natives).....	133

List of Tables

Table 1 - Overview of English possessive adjectives and possessive pronouns.....	15
Table 2 - Overview of Norwegian Bokmål possessives.	19
Table 3 - Overview of Spanish post-nominal possessives.	22
Table 4 - Summary of post-nominal possession and gender encoding in English, Norwegian, and Spanish.	24
Table 5 - Distribution of Spanish articles by gender and definiteness.	28
Table 6 - Summary of number concord encoding in English, Norwegian, and Spanish.	29
Table 7 - Summary of the canonical adjective placement encoding in English, Norwegian, and Spanish.	32
Table 8 - Summary of the null subject parameter encoding in English, Norwegian, and Spanish.	36
Table 9 – Predictions on the source and type of CLI in the performance of the current study’s L3 Norwegian learners by linguistic model and condition.	40
Table 10 - Combinations of properties to be investigated in the subtractive experimental design.	41
Table 11 - Presence vs absence of the tested morphosyntactic properties.	42
Table 12 - Pilot study GJT’s mean scores sorted by group and condition.	52
Table 13 - Linguistic profile of participants groups.	54
Table 14 - Linguistic groups and their Norwegian proficiency scores.	57
Table 15 - L2 and L3 learners grouped by Norwegian proficiency levels.	58
Table 16 - L3 Norwegian learners grouped by L2 English proficiency level.	59
Table 17 - Mean scores of overall target-like performance by group.	59
Table 18 - Mean scores of target-like performance by group and item type.	60
Table 19 - Possessives agreement target-like performance mean scores by group and item type.	63
Table 20 - Mean scores of target-like performance on possessives agreement by L3 Norwegian proficiency.	64
Table 21 - Number concord target-like performance mean scores by group.	66
Table 22 - Mean scores of target-like performance on number concord items by L3 Norwegian proficiency.	66
Table 23 - Adjective placement target-like performance mean scores by group.	67

Table 24 - Mean scores of target-like performance on adjective placement items by L3 Norwegian proficiency.....	68
Table 25 - Subject pronoun expression target-like performance mean scores by group.	69
Table 26 - Mean scores of target-like performance on SPE items by L3 Norwegian proficiency.....	70

List of Figures

Figure 1 - Correlation between Norwegian learners' length of residence in Norway and accuracy.....	57
Figure 2 - Correlation between learners' Norwegian length of study and accuracy.....	57
Figure 3 - Accuracy by linguistic group and condition.....	61
Figure 4 - Spanish target group accuracy by Norwegian proficiency and condition.....	62
Figure 5 - Possessives agreement accuracy by Norwegian level and linguistic group.....	65
Figure 6 - Subject pronoun expression accuracy by Norwegian level and linguistic group....	71
Figure 7 – Participants' responses on psychotypical proximity.....	73
Figure 8 - Participants' responses on background languages' role in L3 Norwegian learning.	75
Figure 9 – Comparison of participants' responses on L3 similarity sorted by language pair and property.	76
Figure 10 - Participants' responses on difficulty level sorted by linguistic property.	77
Figure 11 - Comparison of participants' responses on possessives gender agreement similarity sorted by linguistic pair and Norwegian proficiency level.	79
Figure 12 - Participants' responses on possessives gender agreement difficulty level sorted by Norwegian proficiency level.	80
Figure 13 - Comparison of participants' responses on number concord similarity sorted by linguistic pair and Norwegian proficiency level.	82
Figure 14 - Participants' responses on number concord difficulty level sorted by Norwegian proficiency level.....	83
Figure 15 - Comparison of participants' responses on adjective placement similarity sorted by linguistic pair and Norwegian proficiency level.	84
Figure 16 - Participants' responses on adjective placement difficulty level sorted by Norwegian proficiency level.	85
Figure 17 - Comparison of participants' responses on SPE similarity sorted by linguistic pair and Norwegian proficiency level.	86
Figure 18 - Participants' responses on SPE difficulty level sorted by Norwegian proficiency level.	88

List of Abbreviations

1st, 2nd, 3rd SG/PL	First, second, third person singular/ plural
ADJ-N	Adjective-Noun word order
CEM	Cumulative Enhancement Model
CLI	Cross-linguistic influence
COMM	Common gender
CEFR	Common European Framework of Reference for Languages
DEF	Definite
DET	Determiner
DP	Determiner phrase
ENG	English
FEM	Feminine
GJT	Grammaticality judgment task
INDEF	Indefinite
L1	First language / Native language
L2	Second language
L2A	Second language acquisition
L2SF	L2 Status Factor Model
L3	Third language
L3A	Third language acquisition
Ln	Languages acquired after L3
LPM	Linguistic Proximity Model
MASC	Masculine
N-ADJ	Noun-Adjective word order
NEUT	Neuter
NOR	Norwegian
NSP	Null subject parameter
PL	Plural
POSS	Possessive
SG	Singular
SPA	Spanish
SPE	Subject pronoun expression
TPM	Typological Primacy Model

1 Introduction

Multilingualism is currently becoming a commonplace achievement, rather than an exception, for most of the world's population (Flynn *et al.*, 2004; Wang, 2013). In this context, research on third language acquisition (L3A) as an independent area has gained an increasing interest over the last decades, as it has been acknowledged the previous acquisition of two language systems makes the L3A a unique process worth of investigation in its own right (Rothman & Cabrelli Amaro, 2009).

Over the past decade, formal approaches to L3A based on empirical data from a variety of language combinations have emerged, especially in the domain of morphosyntax (Agirre & García Mayo, 2013). While generative studies on L3A have found conclusive evidence of linguistic influence from one or both of the previously acquired languages, i.e. L1 and L2, into the L3 (Tavakol & Jabbari, 2014), the source and nature of CLI is still subject of significant debate, in special due to the high variability of findings across studies. Seeking to explain the phenomenon of CLI in L3A, several competing models have emerged in recent years, mainly composed by holistic based models, among which 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), and by property-by-property based models, such as the Cumulative Enhancement Model (Flynn *et al.*, 2004) and the Linguistic Proximity Model (Westergaard *et al.*, 2017).

In light of this, the main goal of the present thesis is to test these L3 models in the context of the acquisition of L3 Norwegian by sequential L1 Spanish – L2 English adult speakers. Specifically, this research explores potential sources of difficulties and/or facilitation in the L3 acquisition process by exploring the role of Spanish and English as previous acquired languages in the developmental (beginner, elementary, and pre-intermediate levels) acquisition of L3 Norwegian morphosyntax. In addition, the investigation explores distinct factors that can potentially contribute to the transferability of linguistic features between interlanguages (Wang, 2013), such as the (psycho)typological proximity between the languages involved, L2 and L3 proficiency levels, and the difficulty level of acquisition of different morphosyntactic features. The study focus on the acquisition of four linguistic properties, namely (i) possessives gender agreement, (ii) number concord, (iii) adjective placement, and (iv) subject pronoun expression, in order to address the following research questions:

(a) Which of the previously acquired languages is the source of cross-linguistic influence in adult third language acquisition? i.e. is the source of transfer driven by the (i) language status (order of acquisition) or (ii) the typological proximity between the L3 and L1/L2?

(b) Is the cross-linguistic influence of a holistic or property-by-property nature?

Finding answers to these questions are of uttermost importance for the understanding of how previously acquired languages interact and what kind of influence they pose in the acquisition of an L3 at different stages of development.

The present thesis is organized as follows: section 2 introduces the theoretical background and literature review most relevant for the study. Section 3 presents the scope of the present research and provides a detailed account of the morphosyntactic properties tested and their characteristics in all three languages under investigation, i.e. English, Norwegian, and Spanish. Section 4 includes the research questions and hypotheses guiding the study and section 5 describes the methods and procedures employed, including the tasks and participants' information. Section 6 provides an overview of the results obtained from the gathered data, followed by the analysis and discussion of the findings in light of current L3A models and the research's hypotheses in section 7. The conclusion, outlook, and limitations of the study are featured in section 8. Finally, the appendices section at the end of this thesis outlines relevant additional information regarding the study's tasks and includes a complete list of all items used for the data collection.

2 Theoretical background

This section covers a brief presentation of key concepts and theories of CLI in L3A relevant for the present thesis research proposal. In subsection 2.1, the key definition of CLI is discussed, followed by the definition of L3 accounted for in this investigation and a short introduction to L3A as an independent field. Subsection 2.3 explores influential factors in CLI in the acquisition process of an L3, and subsection 2.4 reviews five of the main current CLI models in L3A.

2.1 Cross-linguistic influence

Research on CLI endeavors to explain in which manners and conditions previously acquired linguistic knowledge poses an influence in the production, understanding, and development of a target language (De Angelis, 2007). This key term has been widely employed in the studies of L3, but distinctly from the generative second language acquisition (L2A) field, in which the term transfer is generally preferred (Westergaard *et al.*, forthcoming), it is used in numerous studies interchangeably as a synonym to ‘transfer’ (e.g. Abbas *et al.*, 2021; Ben Abbas 2016, 2020; Foryś-Nogala *et al.*, 2020). However, it is important to clarify this collective choice.

The term ‘transfer’ has its origin in the L2A field and has been “widely associated with the direct transfer of habits and fails” into a target language (Wang, 2013, p. 99). More specifically, ‘transfer’ is generally employed to describe the effects of a previously acquired grammar into the values or features of the target language, and it is, therefore, linked to grammatical competence (Westergaard *et al.*, forthcoming). As pointed by Wang (2013), the concept of ‘transfer’, in this sense, is reductionist and fails to account for other phenomena linked to cross-linguistic interaction, such as the *perception* of linguistic distance, and therefore, “is no longer sufficient to account for the parallel activation of languages in multilinguals” (Wang, 2013, p. 99). In addition, the term ‘transfer’ has also been pointed as a fundamentally misleading concept, as there is no ‘movement’ of properties from one language to another, i.e. a grammatical property cannot be transferred “from one location to another since it deprives the host grammar of precisely that property” (Sharwood Smith, 2021, p. 410).

The term ‘CLI’, on the other hand, was introduced to englobe all types of cross-language interactions without rejecting the term ‘transfer’ itself (Sharwood Smith, 2021), besides also being employed to describe cross-linguistic interactions in the domains of phonology, lexicon,

and semantics. In this way, ‘CLI’ has been suggested as a more fitting term for describing the potential effects of a language in the usage and production of another language. While some studies advocate the field should abandon the term ‘transfer’ (e.g. Sharwood Smith, 2021), it is noticeable *transfer* is both a ‘handy’ and well established term in the language acquisition field (Westergaard *et al.*, forthcoming). Therefore, despite acknowledging potential limitations, the terms ‘transfer’ and ‘CLI’ will be used interchangeably as synonyms throughout this thesis in order to refer to the influence features of one language potentially pose into the features of another language.

2.2 Third language acquisition

As briefly introduced, L3A is a fairly recent field of study, which, despite the considerable amount of research over the last two decades, encompasses “an infinitesimal part of all generative studies investigating adult non-primary acquisition” (Rothman & Cabrelli Amaro, 2009, p. 4). As a field in its infancy, there are still divergent definitions of L3A - while some research define L3A as the process of acquiring any non-native language(s) after the L2, and therefore, $L3 = L_n$, other studies, such as the present investigation, consider L3A as the process in which learners who have previously acquired two other languages are in the process of acquiring a new one (Perić & Novak Mijić, 2017), and therefore, $L3 \neq L_n$.

The formal study of L3A is rapidly developing from a multitude of linguistic perspectives, such as sociolinguistics, psycholinguistics, and generative approaches (Rothman & Cabrelli Amaro, 2009). The field is informed by previous research on L2A (Westergaard *et al.*, forthcoming), and similarly to the latter, extensively examines the matter of CLI (Aribaş & Cele, 2021). However, L2A and L3A are two distinct phenomena (Flynn *et al.*, 2004). Within L2A, there is only one system available for transfer, i.e. the L1, and, in this way, its influence has been well attested on L2A process (Schwartz & Sprouse, 1996). As L2 learners have no other potential source of linguistic transfer but their native L1, “it has been impossible to determine what variables condition/motivate specific transfer since there is, simply put, no choice” (Rothman & Cabrelli Amaro, 2009, p. 2). Distinctly from the L2A, L3 learners have two previous sources of linguistic knowledge, i.e. the L1 and the L2, as potential sources of influence. In this scenario, a crucial difference between CLI studies in both fields is summarized in the fact that, while L1 transfer is a logical necessity in L2A, it is not necessarily the case in L3A (Westergaard *et al.*, forthcoming). In addition, as the languages previously acquired by the learner are argued to be interconnected, therefore forming a dynamic system, the patterns

of CLI in L3A are stated to be essentially more complex as compared to those of L2A (Foryś-Nogala *et al.*, 2020).

In light of this, investigating successive multilingual acquisition can provide answers to help understanding whether (a) the L1 is the main source of transfer for all subsequent languages acquired, (b) the latest acquired language is set as the basis source in the acquisition process of the subsequent language (in the present context, the L2 and L3, respectively), or (c) if both the L1 and L2 are equally activated during the multilingual L3 acquisition (Rothman & Cabrelli Amaro, 2009). Not surprisingly, as previously introduced, the L3A field is heavily devoted to the studies on CLI source, i.e. whether all previously learned languages influence the L3, or whether only one of them is chosen as the primary or sole source of influence (Foryś-Nogala *et al.*, 2020; Westergaard *et al.*, 2017). In line with this, “the need to examine L3 acquisition in bilingual contexts from multiple perspectives is determined by the number of variables involved and their multiple interactions, making L3 acquisition a highly complex phenomenon” (Sanz, 2000, p. 37).

2.3 Influential factors in L3A CLI

Due to the extensive variables present in the L3A and the numerous potential interactions between them (Wang, 2013), several factors have been proposed to influence or even determine the source and nature of linguistic transfer (Arıbaş & Cele, 2021). In view of this, the following subsections highlight three of the proposed factors, to be further investigated in the present thesis’ experiment (see section 5 for details).

2.3.1 (Psycho)Typological proximity

Numerous studies on CLI in L3A have pointed to the typological proximity of languages, i.e. “the extent to which the background languages are typologically similar or dissimilar to the L3” (Ben Abbes, 2016, p. 6), as the most influential factor in determining the source language of transfer, especially at the early stages of acquisition (e.g. Rothman 2011, 2013, 2015; Rothman & Cabrelli Amaro, 2009). In this context, the previously language to share more similar linguistic cues to the L3 is the one selected as the source of transfer. As lexical similarities are one of the first cues to be identified by L3 learners (Rothman, 2013), languages that share the same linguistic root (e.g. Romance languages) tend to be more easily identified as typologically proximate.

While the typological proximity factor has been heavily investigated, the psychotypological proximity, here defined as “learners’ perception of the typological proximity between their L1/L2 and the L3” (Ben Abbes, 2016, p. 11), is deemed to have been ignored in many of current generative L3A research (Ben Abbes, 2016). Following pioneer studies by Kellerman (1979, 1983, 1986), this factor plays a key role in the non-native language acquisition process since the greater the perceived distance between languages, i.e. the psychotypological proximity, the lower the incidence of influence. However, as highlighted by Ben Abbes (2016, p. 11), “it is very difficult to design an instrument or a test that could directly target the assessment of psychotypology in L3A. Any attempt in this direction, however, will add much to the body of knowledge in L3A”. This topic is further developed in section 5.2.3, in which an adaptation of Ben Abbes’ (2016, 2020) questionnaire on linguistic relatedness perception proposed in the present study is presented.

In addition to the (psycho)typological proximity, it is noteworthy that some of the current L3A studies (e.g. Jensen *et al.*, 2021; Westergaard *et al.*, 2017) have also pointed to the individual structural proximity of languages, i.e. the similarities of linguistic properties (e.g. word-order, null subject parameter), as a triggering factor of CLI. In this context, the linguistic proximity is not only accounted on a general, or holistic, perspective, but also on a property-by-property view.

In the present thesis, thus, the terms ‘typological proximity’ and ‘structural proximity’ will be respectively used to refer to holistic and property-by-property linguistic proximity.

2.3.2 L2 and L3 proficiency levels

The proficiency levels in both the L2 and L3 have also been advocated to play a key role in the CLI in L3A (Foryś-Nogala *et al.*, 2020). Research by Bardel and Falk (2007), for instance, argues the degree in which the L2 can potentially influence the L3A is directly associated to learners’ L2 proficiency, in which the higher the proficiency level, the likelier it is to L2 features to be transferred into the L3. In regards to L3 proficiency, Westergaard *et al.* (forthcoming) point it could be the case that at early stages of L3A, linguistic representations such as grammatical and lexical features may still be relatively unstable, leading to stronger effects of CLI as the activation level of previously acquired languages, such as the L2, might be higher. In the same vein, learners’ at more advanced developmental stages may present lower effects of CLI in their L3 as they accumulate substantial knowledge of the target language while

gaining a better control to inhibit representations from previously acquired languages, such as the L1 and L2 (Westergaard *et al.*, forthcoming).

2.3.3 Linguistic property acquisition difficulty

Another key factor of CLI is the acquisition difficulty level of individual linguistic features. This factor is still understudied in the L3A field, in great part due to the fact that most of currently L3 research focus on one single property, making this variable not appropriate for investigation (Ben Abbes, 2016). However, morphosyntactic properties “are not all equal in terms of their difficulty levels nor with regard to the amount of time each property requires to develop” (Ben Abbes, 2016, p. 13). In line with this, some linguistic features, such as the ones related to functional morphology, are attested to be inherently more difficult to acquire (Slabakova, 2016). Evidence for this factor has been found in L2A studies and has been proposed under the label of ‘the Bottleneck Hypothesis’ (Slabakova, 2008, 2013, 2016). The acquisition difficulty of individual properties has also been linked to the availability of input and triggering evidence of such feature in the input (Slabakova, 2016).

2.4 Models of CLI in L3A

In the morphosyntax domain, there are currently five main competing hypothesis regarding the source and nature of CLI in L3A. The following subsections present an overview of these models, highlighting how their findings provide divergent explanations concerning the causes underlying CLI, be it either at the initial state or at more advanced levels of L3 proficiency. The present thesis adopts the terms ‘wholesale’ and ‘partial’ transfer models in order to divide the models into two main categories.

2.4.1 Wholesale transfer models

Wholesale transfer models predict one of the previously acquired languages to be transferred in its entirety into the L3 while the other language remains neutral, as it does not transfer any features to the L3. Three of the main current CLI models fall under this category, namely (a) the L1 Factor (Hermas, 2010, 2014), (b) the L2 Status Factor (Bardel & Falk, 2007; Falk & Bardel, 2011), and (c) the Typological Primacy Model (Rothman, 2011, 2013, 2015). However, these models greatly differ in regards to what are the factors to determine the source of transfer, that is, whether it is the L1 or the L2. The holistic transfer models are introduced as follows.

2.4.1.1 L1 Factor

The L1 Factor (Hermas, 2010, 2014) argues the L1 is the selected language to be holistically transferred in the L3A. In this way, both facilitative and non-facilitative transfer are possible, as the L1 is advocated to always be the sole source of transfer, overriding the effects of language proximity and psychotypology. Although not formalized as a model, evidence for the L1 Factor has been found in Hermas' (2010, 2014) studies on the early state L3A of English morphosyntax by L1 Arabic – advanced L2 French. Hermas' investigations focused on the acquisition of L3 English verb movement parameter (Hermas, 2010, 2014), and the null subject parameter (Hermas, 2014). In both investigations, results pointed to participants' morphosyntactic transfer of L1 Arabic into L3 English at early stages.

2.4.1.2 L2 Status Factor

The L2 Status Factor model (L2SF, Bardel & Falk, 2007; Falk & Bardel, 2011) advocates the L2 is the source language of transfer in the acquisition of an L3. The transfer occurs holistically, as features from the L1 are blocked, and can be both facilitative and non-facilitative. According to the L2SF model, learners tend to transfer the L2, rather than the L1, as the L2 learning experience shares more similarities with the L3 acquisition as compared to the naturalistic acquisition of the L1, such as the degree of metalinguistic awareness of syntactic features, age of onset, and learning environment. Evidence for this model has been found in numerous studies on L3 acquisition (e.g. Bardel & Falk, 2007; Brown, 2020; Falk & Bardel, 2011) involving different features (e.g. placement of sentential negation, grammatical gender, placement of object pronouns) and language combinations. Two main studies to corroborate to the L2SF as a model are briefly presented as follows.

Bardel and Falk (2007) tested the acquisition of L3 Dutch and Swedish placement of sentential negation in main finite clauses. Both L3s investigated are V2 languages, in which finite verbs precede negation. Participants of the experiment were composed by two groups according to their previous languages, in which one group had a non-V2 L1 (English, Hungarian, Italian, or Albanian) and a V2 L2 (German and/or Dutch), and the other group, a V2 L1 (Dutch or Swedish) and a non-V2 L2 (English). Results showed that the L2 was the only source of influence at the early stages of L3A, as participants with a non-V2 L1 – V2 L2 produced target-like negation structures, in which negation is placed in post-verbal position, while V2 L1 – non-V2 L2 participants produced pre-verbal negation, a non-target like structure.

Falk and Bardel (2011) found further evidence for the L2SF model in the investigation of L3 German object pronoun placement. The experiment targeted intermediate level L3 learners of two groups, one with L1 English – L2 French, and a mirrored group composed by L1 French – L2 English speakers. In main clauses, English and German present a similar structure, in which object pronouns are placed in post-verbal position, while in subordinate clauses, German and French are structurally similar since, in both languages, object pronouns appear in pre-verbal position. Results pointed both groups' performances were influenced by their L2, as in main and subordinate clauses, (i) participants with L2 French accepted object pronouns in pre-verbal position, while (ii) participants whose L2 was English showed a tendency to accept post-verbal object pronouns.

2.4.1.3 Typological Primacy Model

Distinctly from the L1 Privilege and L2SF models, the Typological Primacy Model (TPM, Rothman, 2011, 2013, 2015) advocates the main factor to determine the source of L3 CLI at early stages is not the order of acquisition, but rather the (psycho)typological proximity between the languages involved, in which the typologically (perceived) closest language to the L3 is the one to be transferred. According to this model, the transfer occurs holistically, and can be both facilitative and non-facilitative, as learners will transfer all properties of the typologically more similar language into the L3.

The TPM model was proposed in Rothman (2011) and further elaborated in Rothman (2013, 2015). Rothman (2011) tested the knowledge of adjectival placement and its semantic nuances in two L3 groups, namely L1 Italian – L2 English – L3 Spanish, and L1 English – L2 Spanish – L3 Brazilian Portuguese. The overall results showed the source of CLI in L3 Spanish and L3 Brazilian Portuguese derived from L1 Italian and L2 Spanish, respectively. These findings pointed to a CLI based on the typological proximity rather than the chronological order of acquisition, as in both groups, the language transferred pertained to the same linguistic group as the L3 (in this case, Romance languages).

Rothman (2013) has further advocated the source language of transfer is selected following a hierarchy of linguistic cues, composed by lexical, phonological, morphological, and syntactic features, respectively. According to his research, lexical similarities are one of the first cues to be identified by L3 learners, as they are more easily identified at early stages of acquisition as compared to phonological or morphological similarities, which require a more advanced knowledge of the language. In this way, Rothman (2013, 2015) states the linguistic

proximity of previous languages and the L3 is perceived by the learner on a holistic basis, rather than on a property-by-property basis, as soon as enough input is received, that is, enough linguistic information for the learner to evaluate which previous language presents more similarities to the L3. The holistic basis transfer is advocated to occur due to the called “cognitive economy” (Rothman, 2013, p. 219), in which the learner’s mind seeks to simplify the process of L3 acquisition by using features that are already available from previous languages.

Evidence for the TPM model has further been attested in many current studies of L3 CLI at early stages (e.g. Ben Abbas, 2020; Picoral & Carvalho, 2020; Puig-Mayenco & Marsden, 2018) involving different language combinations and grammatical features (e.g. adjective placement, number concord, null-subject parameter). Nevertheless, it is noteworthy that evidence accounting for the TPM has predominantly been found in studies comparing English and Romance Languages, while evidence from combinations of typologically more distant languages is still scarce.

2.4.2 Partial transfer models

Oppositely to the wholesale transfer models, partial transfer models propose that all previously learned languages carry the possibility of influencing the L3A. In this scenario, linguistic features are not transferred from the L1 or L2 systems all at once (Ben Abbas, 2020). Instead, CLI is advocated to occur property-by-property. Two of the main current CLI models fall under this category, namely the Cumulative Enhancement Model (Flynn *et al.*, 2004) and the Linguistic Proximity Model (Westergaard *et al.*, 2017). These models are briefly presented as follows.

2.4.2.1 Cumulative Enhancement Model

The Cumulative Enhancement Model (CEM, Flynn *et al.*, 2004) predicts the language learning process is cumulative and CLI in multilingual development can potentially originate from both the L1 and the L2, irrespective of the order of acquisition. Nevertheless, the CEM supports that transfer from previous languages is either facilitative or remains neutral, while non-facilitative transfer is advocated not to occur.

The study by Flynn *et al.* (2004) investigated the knowledge of English restrictive relative clauses by an adult L1 Kazakh – L2 Russian – L3 English group and a child L1 Kazakh – L2 English group. Kazakh is a head-final and left-branching language, while English and Russian

are head-initial and right-branching languages. In sum, results pointed the adult L3 English group had significantly outperformed child L2 English group. Flynn *et al.* (2004) concluded the difference in accuracy shown by the adult L3 group and the child L2 group was a result of adult learners having a previous knowledge of L2 Russian, which enhanced their learning of complementizer phrase properties in L3 English. The L2 child group, on the other hand, was less accurate in comparison to the L3 adult group since their English acquisition of relative clauses was not enhanced by their L1 Kazakh, as both languages present distinct structures. These findings are argued by Flynn *et al.* (2004) to support the CEM.

2.4.2.2 Linguistic Proximity Model

The Linguistic Proximity Model (LPM, Westergaard *et al.*, 2017) advocates the CLI in L3 acquisition occurs in a property-by-property basis, in which “*anything can transfer, [but] not everything does transfer*” (Westergaard *et al.*, forthcoming, p. 3). In this sense, the LPM advocates the CLI can occur from both the L1 and L2, as the learner relies on both previously acquired grammars during all stages of L3 acquisition. The CLI can be both facilitative and non-facilitative, being the first influenced by the similarities of linguistic properties of the previous languages and the ones of the L3, and the latter, a possible product of (i) L3 input misanalysis, i.e. learners incorrectly assimilating a linguistic property is shared between a previous language and the L3, (ii) input deficiency, i.e. when the learner has not yet received enough input of an specific property to correctly identify its (dis)similarities with the L3, and/or (iii) due to the co-activation of competing related structures of both previously-acquired languages.

The LPM was introduced in Westergaard *et al.* (2017) study on child L3 English word-order acquisition by first language Russian-Norwegian bilinguals. The investigation compared the L3 group performance with two L2 English groups of matched ages, in which one was composed by L1 Norwegian, and the other, by L1 Russian. The study tested two word order phenomena, namely adverb-verb word order, in which English behaves similarly to Russian and differently from Norwegian (verb second language), and subject-auxiliary inversion, in which English (residual verb second) is similar to Norwegian and distinct from Russian. Results pointed the subject-auxiliary inversion property was already acquired by all learners, while the adverb-verb phenomenon pointed L3 learners scored between the two L2 control groups, which indicated the Russian-Norwegian bilinguals’ performance was influenced by both previous

languages. This latter finding supported the LPM proposal, as both previous grammars proved to be equally available as a source of CLI in the acquisition of an L3.

The LPM has further been supported by a few recent studies (e.g. Ben Abbas 2016, 2020; Jensen *et al.*, 2021). It is noteworthy that investigations to support the LPM tested the L3 acquisition of more than one single property, distributed in distinct linguistic modules (e.g. morphology, syntax, semantics).

3 The scope of the present study

The present study aims to contribute filling in two main gaps in the current literature of CLI in L3A. Firstly, as highlighted by Ben Abbes (2016), Lundquist *et al.* (2020), and Westergaard *et al.* (forthcoming), while most of current research focus on a single linguistic property in isolation (e.g. Forys-Nogala *et al.*, 2020; Ghezlou *et al.*, 2018; Tavakol & Jabbari, 2014), not many studies have tested the L3A models through the investigation of more than one or two properties. The present research, then, approaches the study of CLI in L3A by the investigation of four distinct morphosyntactic properties, as the test of various different features can account for a possible variation between one property to another (Ben Abbes, 2016). Moreover, the study of multiple linguistic features allows a comparative investigation of the acquisition difficulty level of individual properties, a still understudied factor in the L3 domain.

Secondly, the language proximity, from both holistic and property-by-property perspectives, has not been measured in L3A from speakers' own perception and assessment (see Ben Abbes 2016, 2020 for exception). In this context, designing a scale of measurement of such kind could provide a richer picture on the role of the psychotypological proximity and perceived structural proximity effects over the real similarity of languages (Ben Abbes, 2016). This issue is of special importance for the debate promoted by the TPM (Rothman, 2011, 2013, 2015) and LPM (Westergaard *et al.*, 2017), as both models account for learners' possible incorrect assumption on language similarity (see section 2.4 for details). The study of four different properties, then, can be used to address the issue on whether speakers perceive the role of linguistic similarity on a holistic or on a property-by-property basis with the employment of a questionnaire aimed to directly ask speakers' on their linguistic perceptions.

In light of this, the following subsections bring a panorama of the four morphosyntactic properties addressed in this study, highlighting the relevant (dis)similarities of features between the considered languages, i.e. English, Norwegian (*Bokmål*¹), and Spanish. This language combination was chosen due to (a) the location in which the present research was developed, i.e. Norway, a country home to numerous international university-level students to whom

¹ In Norway, there are two written standard languages, namely *Bokmål* and *Nynorsk* (for a detailed discussion, see Faarlund *et al.*, 1997). For the means of the present thesis, the Norwegian written language analyzed is the Norwegian *Bokmål*.

English is the language of education, and (b) the large community of native Spanish speakers in Norway.

3.1 Nominal possessives agreement: cross-linguistic variation

The expression of possession entails complex syntactic and semantic properties realized through possessive constructions (Vásquez Carranza, 2010). Possessives, which can be defined as determinants that indicate property or affiliation (Faarlund *et al.*, 1997, p. 203), comprise a rich class whose meaning involves three main elements, namely the possessor, i.e. the ‘owner’ entity of the DP (Fabricius-Hansen *et al.*, 2017), the possessum, i.e. “the entity that is identified as ‘belonging to’ the possessor” (Fabricius-Hansen *et al.*, 2017, p.7), and the relation between them, referred to as the possession relation (Barker, 2011).

Possessive constructions present diverse patterns cross-linguistically (Orozco, 2018), displaying, for instance, a rich variation in word order, such as pre- and post-nominal position, and in the expression of agreement, as gender and number markers (Bernstein, 2005; Fabricius-Hansen *et al.*, 2017). In this scenario, linguistic expressions of possession are a recurrent topic on cross-linguistic research (e.g. Anderssen *et al.*, 2018; Bernstein, 2005; Fábregas *et al.*, 2019). However, still little is known on how possessive contrasts between L1 and L2/Ln, that is, morphosyntactic similarities and differences between languages, are reflected in the non-native language acquisition (Fabricius-Hansen *et al.*, 2017).

In light of this, the following subsections examine the variation of possessives’ word order and expression of agreement in English, Norwegian, and Spanish, the languages focused on the present thesis. A framework of the possessives’ variation both within these particular languages, as well as of their cross-linguistic (dis)similarities, is explored. The present research especially focuses on post-nominal possessives gender agreement, a topic which remains scarcely researched in the domain of adult L3A. For the means of this research, the definition of grammatical gender adopted is the one presented in Busterud *et al.* (2019, p. 142), in which “gender is defined as agreement with the noun that is marked on other items such as determiners, adjectives, and possessives”.

3.1.1 Possessives agreement in English

The English language presents a variety of ways of expressing possession (Börjars *et al.*, 2013), among which the most commonly contrasted structures are the pre- and the post-nominal

possessives (Barker, 2011; Börjars *et al.*, 2013; Peters & Westerståhl, 2013). Particularly, English has two main ways of expressing possessives, namely by non-pronominal noun phrases and by pronominal elements (Eisenbeiss *et al.*, 2009). The non-pronominal noun phrases, also referred to as nominal possessives, are expressed by *s*-possessives and *of*-possessives (Barker, 2011; Börjars *et al.*, 2013; Marinis, 2016; Vásquez Carranza, 2010), as illustrated in (1).

(1) a. My sister’s cat.

b. The cat **of** my sister.

(Marinis, 2016, p. 435)

The *s*-possessive, also known as ‘Saxon genitive’, is pre-nominally realized with the ‘*s*’ marker (Barker, 2011; Vásquez Carranza, 2010), as in (1a), while the *of*-possessive is post-nominally realized with the preposition *of*, which combines with the possessum to form a nominal phrase (Barker, 2011; Peters & Westerståhl, 2013; Vásquez Carranza, 2010), as in (1b). The pronominal possessive elements, in turn, are syntactically realized by possessive adjectives and a possessive form of pronouns (Barker, 2011), as shown in Table 1.

Table 1 - Overview of English possessive adjectives and possessive pronouns.

Person	Number	Possessive adjectives	Possessive pronouns
1 st	Singular	my	Mine
2 nd		your	Yours
3 rd		his	His
Masc.		her	Hers
Fem.		its	Its
[- human]			
1 st	Plural	our	Ours
2 nd		your	Yours
3 rd		their	Theirs

Source: based on Fabricius-Hansen *et al.* (2017, p. 5), and Samad & Arshad (2017, p. 274).

The English possessive adjectives occur before overt nouns (Babatsouli & Nicoladis, 2019; Samad & Arshad, 2017), as in (2a), and are dependent on the noun that follows (Samad & Arshad, 2017) since they cannot appear in isolation (Ihsane, 2003), as exemplified in (3a). On the other hand, possessive pronouns, which have a nominal function (Babatsouli & Nicoladis, 2019), occur after the noun (Samad & Arshad, 2017), and their co-occurrence with overt nouns is ungrammatical (Ihsane, 2003), as in (2b). Another characteristic of the English

possessive pronouns is that they allow isolation and ellipsis constructions, such as (3b) and (4), respectively.

- (2) a. **My** book.
- b. ***Mine** book.
- (3) Speaker A: Whose book is this?
- Speaker B: a. ***Her**/ b. **Hers**.
- (4) My friend has introduced **hers** to me.

(adapted from Ihsane, 2003, p. 34)

In regard to agreement, English establishes a semantic agreement between the possessive and the possessor (Agirre & García Mayo, 2013), in which “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, p. 19). In this scenario, it is noteworthy that English is considered a gender-free language, in which gender contrasts are semantic in nature (Agirre & García Mayo, 2013; Ben Abbes, 2016), that is, there are no syntactic rules that explicitly refer to gender distinctions (Agirre & García Mayo, 2013). Nevertheless, a contrast between natural gender (male/female) and [- human] values is realized on third person singular possessive adjectives and pronouns, which exhibit overt morphological agreement with the possessor noun (Agirre & García Mayo, 2013; Ben Abbes, 2016; Fabricius-Hansen *et al.*, 2017), as illustrated in Table 1 above and further exemplified in (5).

- (5) a. **He_i** is playing with **his_i** brother.
- b. **She_i** is playing with **her_i** brother.

(Agirre & García Mayo, 2013, p. 421)

3.1.2 Nominal possessives agreement in Norwegian

The Norwegian language allows both pre- and post-nominal possessives (Anderssen *et al.*, 2018; Faarlund *et al.*, 1997, 2019; Fabricius-Hansen *et al.*, 2017; Lundquist *et al.*, 2020; Lødrup, 2011; Rodina & Westergaard, 2021), displaying, this way, the occurrence of two possessive word orders. As illustrated in (6), the Norwegian possessor can either precede (pre-nominal) or follow (post-nominal) the noun (Fábregas *et al.* 2019).

- (6) a. **Min** venn.
- My.POSS friend.
- ‘My friend.’

b. Venn-en **min**.

Friend-DEF my.POSS

‘My friend.’

(adapted from Anderssen *et al.*, 2018, p. 749)

In Norwegian, the pre- and post-nominal possessive word order variation is highly dependent on information structure (Fábregas *et al.*, 2019). The pre-nominal form is generally associated with a contrastive interpretation (Anderssen *et al.*, 2020; Lødrup, 2011), in which the prominence is on the possessor (Fábregas *et al.*, 2019). In contrast, the post-nominal possessive is generally presented in either neutral contexts (Lødrup, 2011), or “when the possessive relationship is backgrounded” (Fábregas *et al.*, 2019, p. 118). In the post-nominal form, the noun is the one to receive prosodic prominence (Fábregas *et al.*, 2019). An illustration of this variation is observable from an excerpt of Rodina and Westergaard’s experiment (2021), transcribed in (7) and (8). It is noteworthy that, even though the two possessives word orders are associated with distinct semantic configurations, there is a variety of contexts in which either structure can be used (Lundquist *et al.*, 2020).

- (7) - Hans bil er gul. Ka med deg?
‘His car is yellow. What about you?’
- **Min** bil er rød.
‘My.MASC car is red.’
- (8) - Ka skjedde?
‘What happened?’
- Bil-en **min** forsvant.
‘Car-DEF my.MASC disappeared.’

(adapted from Rodina & Westergaard, 2021, p. 250)

Besides the distinct semantic contexts, there is a sharp quantitative difference in the distribution of pre- and post-nominal possessives in spoken Norwegian. Following Anderssen and Westergaard (2010), the use of post-nominal possessives is significantly more frequent than the one of pre-nominal possessives, accounting for approximately 75% of possessive constructions in adult speech. Oppositely, in the written language, Lødrup (2011) points there is a tendency that pre-nominal possessives are more frequent than the pre-nominal counterpart, especially in regards to the non-colloquial style.

As observable from examples (6) to (8), pre- and post-nominal possessives in Norwegian are morphologically identical, presenting the same inflection in person, number, and gender (Fábregas *et al.*, 2019; Fabricius-Hansen *et al.*, 2017). Despite that, the two possessives' word orders present important structural differences. On the one hand, Norwegian pre-nominal possessives co-occur with a bare noun (Lundquist *et al.*, 2020), also known as a universal quantifier (Lødrup, 2011). This way, nouns mandatorily present indefinite morphology with pre-nominal possessives (Rodina & Westergaard, 2021), as in (6a). On the other hand, post-nominal possessives require the definite article on the noun (Faarlund *et al.*, 2019; Lundquist *et al.*, 2020). Along these lines, Norwegian post-nominal possessives must immediately follow a noun with the definite suffix (Fabricius-Hansen *et al.*, 2017; Rodina & Westergaard, 2021), as exemplified in (6b). In this scenario, differently from pre-nominal possessives, no linguistic material can be placed between the noun and the post-nominal possessive (Lødrup, 2011), as illustrated in (9) and (10) below.

- (9) **Min** nye analyse av diktet.
My new analysis of poem.DEF
- (10) Den nye analysen **min** av diktet / * av diktet **min**.
The new analysis.DEF my of poem.DEF / of poem.DEF my
'My new analysis of the poem'

(Lødrup, 2011, p. 385)

Regarding the nominal possessives agreement system, Norwegian also presents important structural differences according to the grammatical person, i.e. which person the possessives refer to (Faarlund *et al.*, 1997). In this context, some of the Norwegian possessives agree in number and gender with the noun (Lødrup, 2011), as, for instance, in the case of the first person singular, second person singular, and reflexive third person singular. In both pre- and post-nominal word-orders, these possessives agree with the possessum (Fábregas *et al.*, 2019). An example is provided in (11) for post-nominal possessives.

- (11) a. bil-en {min/ din/ sin}
car-DEF my.MASC / your.MASC / his/her.MASC
- b. bok-a {mi/ di/ si}
book-DEF my.FEM / your.FEM / his/her.FEM
- c. hus-et {mitt/ ditt/ sitt}
house-DEF my.NEUT / your.NEUT / his/her.NEUT

d. bilene {mine/ dine/ sine}
 car.PL.DEF my.PL / your.PL / his/her.PL

(Fábregas *et al.*, 2019, p.121)

Oppositely, some other possessives only have one form, as, for instance, in the case of the non-reflexive third person *hans* ‘his’ and *hennes* ‘hers’ (Lødrup, 2011), which “recovers the number and gender features of the possessor” (Fábregas *et al.*, 2019, p. 120). An overview of the nominal possessives in Norwegian *Bokmål* is displayed in Table 2 below.

Table 2 - Overview of Norwegian *Bokmål* possessives.

Person	Number	Singular			Plural
		Masc.	Fem.	Neut.	
1 st	Singular	min	mi/min	mitt	mine
2 nd		din	di/din	ditt	dine
3rd (non-reflexive)					
Masc.		hans	hans	hans	hans
Fem.		hennes	hennes	hennes	hennes
Neut.	dets	dets	dets	dets	
3rd (reflexive)		sin	si/sin	sitt	sine
1 st	Plural	vår	vår	vårt	våre
2 nd		deres	deres	deres	deres
3rd (non-reflexive)		deres	deres	deres	deres
3rd (reflexive)		sin	si/sin	sitt	sine

Source: adapted from Fabricius-Hansen *et al.* (2017, p. 5).

In regard to gender agreement, it is noteworthy that only three of the nominal possessive forms mark the traditional three-gender distinction, namely the first person singular, the second person singular, and the reflexive third person possessives (Rodina & Westergaard, 2021), as observable from Table 2 above. The traditional Norwegian gender system consists of three genders, featuring feminine, masculine, and neuter values, in which gender can be based either on natural gender (e.g. *en mann* ‘a.MASC man’) or grammatical gender (e.g. *et bord* ‘a.NEUT table’). In spite of that, the Norwegian *Bokmål* grammatical system is undergoing changes on its three-gender system. According to recent studies (e.g. Busterud *et al.*, 2019; Lundquist & Vangnes, 2018; Rodina & Westergaard, 2021), a number of Norwegian dialects, such as some

varieties of the Oslo and Trondheim dialects, are shifting into a two-gender language (featuring common and neuter genders). In this two-gender system, feminine forms are ‘suppressed’ (Fabricius-Hansen *et al.*, 2017), as masculine and feminine forms are collapsed into a ‘common gender’ (henceforth COMM), realized by masculine forms (Busterud *et al.*, 2019), while neuter nouns remain unchanged (Rodina & Westergaard, 2021). An illustration is given in (12) for the replacement of the feminine indefinite article by the COMM form.

- | | | | |
|------|------------------|----------------|---------------|
| (12) | a. en bil | ei dame | et hus |
| | a.MASC car | a.FEM lady | a.NEUT house |
| | ‘a car’ | ‘a lady’ | ‘a house’ |
| | b. en bil | en dame | et hus |
| | a.COMM | a.COMM lady | a.NEUT house |
| | ‘a car’ | ‘a lady’ | ‘a house’ |

(Rodina & Westergaard, 2021, p.236)

The shift into a two-gender language has also implications on the definite suffix forms. In the Trondheim dialect, for instance, historically feminine nouns are reported to occasionally be produced with the masculine suffix *-en* instead of the feminine suffix *-a* (Busterud *et al.*, 2019). In the Bergen dialect, which underwent the change from the traditional three-gender to a two-gender system centuries ago, the feminine indefinite article is no longer used, and some feminine nouns prompt the same inflection found in masculine nouns (Busterud *et al.*, 2019), preserving only the distinction between the neuter and COMM, as shown in (13). For means of comparison, (14) illustrates the feminine form present in the typical Norwegian three-gender system.

- | | |
|------|--------------------|
| (13) | a. en jente |
| | a.COMM girl |
| | b. jent en |
| | girl.DEF |
| (14) | a. ei jente |
| | a.FEM girl |
| | b. jent a |
| | girl.DEF |

(Busterud *et al.*, 2019, p. 146)

In sum, the Norwegian nominal possessive system is considered particularly complex from a morphosyntactic viewpoint as it allows both pre- and post-nominal possessives (Fabricius-Hansen *et al.*, 2017), which behave both semantically and structurally distinctly. In addition, the language system presents number and gender inflections in most of possessives (Faarlund *et al.*, 1997), of which are open for dialectal variation (Fabricius-Hansen *et al.*, 2017). Considering its high complexity, the acquisition of the Norwegian grammatical possessive system is regarded as a hard and complex process even for native speakers (Fabricius-Hansen *et al.*, 2017), a point which should be further considered in the investigation of Norwegian as a non-native language.

3.1.3 Nominal possessives agreement in Spanish

Possession is expressed in Spanish by means of numerous morphosyntactic devices (Orozco, 2018). The expression of nominal possession, in particular, can occur both pre- and post-nominally (Bernstein, 2005; Bertolotti, 2014; Fábregas *et al.*, 2019; Mare, 2014; Picallo & Rigau, 1999; Van Peteghem, 2012), as exemplified in (15).

(15) a. **Su** hijo.

His/her/their.POSS son

‘His/her/their son’

b. Un hijo **suyo**.

A son his/her/their.POSS.MASC

‘His/her/their son / a son of his/hers/theirs’

(adapted from Fábregas *et al.* 2019, p. 117)

As shown in (15), the two word orders require distinct forms of the possessive. In the pre-nominal position, the Spanish nominal possessives require a short form (Fábregas *et al.*, 2019), which is characterized by a monosyllabic consonant-vowel structure (Bertolotti, 2014; Picallo & Rigau, 1999). Besides, this type of nominal possessive presents an unstressed form (Bertolotti, 2014), in which the agreement between the possessive and the noun is solely marked in grammatical number (Agirre & García Mayo, 2013; Bernstein, 2005; Picallo & Rigau, 1999), as exemplified in (16). Nevertheless, there are two exceptions to these generalizations, present in the first person plural *nuestro* and second person plural *vuestro*. These forms, distinctly from the other pre-nominal possessives, are multisyllabic and agree both in gender and number with the noun (Picallo & Rigau, 1999), as illustrated in (17).

- (16) a. **Su** impresora.
 His/her/their.POSS.SG printer.FEM.SG
 ‘His/her/their printer’
 b. **Sus** bolígrafos.
 His/her/their.POSS.PL pens.MASC.PL
 ‘His/her/their pens’
- (17) a. **Nuestro** ordenador.
 Our.POSS.MASC.SG computer.MASC.SG
 ‘Our computer’
 b. **Vuestras** sillas.
 Your.POSS.FEM.PL chairs.FEM.PL
 ‘Your chairs’

(adapted from Picallo & Rigau, 1999, p. 979)

Post-nominal possessives, in turn, are morphologically more complex than their pre-nominal counterparts (Bernstein, 2005). The Spanish post-nominal possessives present a long form (Fábregas *et al.*, 2019), as in (15b), and display a multisyllabic stressed structure (Bertolotti, 2014). Differently from most of pre-nominal possessives, gender is robustly expressed on post-nominal forms (Bernstein, 2005), as shown in Table 3.

Table 3 - Overview of Spanish post-nominal possessives.

Person	Number	Singular		Plural	
		Masc.	Fem.	Masc.	Fem.
1st	Singular	mío	mía	míos	mías
2nd		tuyo	tuya	tuyos	tuyas
3rd		suyo	suya	suyos	suyas
1st	Plural	nuestro	nuestra	nuestros	nuestras
2nd		vuestro	vuestra	vuestros	vuestras
3rd		suyo	suya	suyos	suyas

Source: adapted from Van Peteghem (2012, p. 624).

As exemplified in (18), the Spanish post-nominal possessives always display agreement both in number and gender with the possessum (Agirre & García Mayo, 2013; Bernstein, 2005; Bertolotti, 2014; Fábregas *et al.*, 2019; Picallo & Rigau, 1999). It is noteworthy that Spanish

presents two types of gender, one based on natural gender, and one based on grammatical gender, in which inanimate nouns are assigned in terms of masculine/feminine values based on arbitrary criterion (Agirre & García Mayo, 2013). In regards to grammatical gender, it is noticeable that, in most cases, the gender assignment does follow a morphosyntactic pattern, in which the termination *-o* stands for masculine nouns and *-a* for feminine ones (Agirre & García Mayo, 2013).

- (18) a. Un libro {mío/ tuyo/ suyo}
 a book.MASC my.MASC/ your.MASC/ his.her.their.MASC
 ‘A book of mine/ yours/ his.hers.theirs’
- b. Una casa {mía/ tuya/ suya}
 a house.FEM my.FEM/ your.FEM/ his.her.their.FEM
 ‘A house of mine/ yours/ his.hers.theirs’
- c. Libros {míos/ tuyos/ suyos}
 books.MASC.PL my.MASC.PL/ your.MASC.PL/ his.her.their.MASC.PL
 ‘Books of mine/ yours/ his.hers.theirs’

(adapted from Fábregas *et al.* 2019, p. 121)

Another distinctive morphologic property of the Spanish post-nominal possessives is expressed in the established relationship between the possessive and the noun it accompanies (Agirre & García Mayo, 2013). In this context, the post-nominal forms are adjectival in nature and show a predicative behavior (Bernstein, 2005; Van Peteghem, 2012). This adjectival nature allows the combination of post-nominal possessives with determiners such as articles and demonstratives (Van Peteghem, 2012), as can be observed from (18a) and (18b) above. Following Bernstein (2005) and Van Peteghem (2012), the post-nominal adjectival predicative behavior is also one of the features accounting for the more robust display of nominal agreement patterns, as adjectival possessives agree not only in number, but also in gender with the possessum.

Finally, in regard to its semantic usage, the Spanish post-nominal possessives are employed to express contrast, emphasis, or irony (Picallo & Rigau, 1999). Due to its limited semantic campus, the post-nominal possessive is less frequent in Spanish than its pre-nominal counterpart (Fábregas *et al.*, 2019).

Summary of the nominal possessives agreement property

As presented in the previous subsections (3.1.1 to 3.1.3), gender agreement and possession are distinctly expressed in the three languages analyzed in this study. In post-nominal forms, the focused structure on this thesis, Norwegian (excepting non-reflexive forms) and Spanish present similar morphosyntactic features, in which the possession establishes number and gender agreement between the possessive and the possessum. In addition, Norwegian and Spanish have both natural and grammatical genders. On the other hand, English establishes agreement between the possessive and the possessor, in which only the third person singular possessive pronouns, to certain extent, agree in gender with the possessor. Also differently from Norwegian and Spanish, gender classes are only differentiated in English pronouns based on natural gender.

In sum, Norwegian and Spanish, although typologically different languages, present a similar behavior in regards to post-nominal possessives' gender agreement as compared to English. Table 4 highlights the cross-linguistic differences between English, Norwegian, and Spanish on the basis of post-nominal possessives and gender.

Table 4 - Summary of post-nominal possession and gender encoding in English, Norwegian, and Spanish.

Post-nominal possessives gender agreement	English	Norwegian	Spanish
Possessor agreement	✓	✗	✗
Possessum agreement	✗	✓	✓
Natural gender	✓	✓	✓
Grammatical gender	✗	✓	✓

Notes: ✓ = the property is present; ✗ = the property is not present. For English, values are shown for 3rd person singular. For Norwegian, values are shown for reflexive forms.

In the context of the present study, the (dis)similarities between the analyzed languages can be schematic represented as follows:

$$L3 \text{ NOR} = L1 \text{ ESP} \neq L2 \text{ ENG}$$

3.2 Number concord: cross-linguistic variation

Grammatical number can be defined as the system contrasting singular and plural (Payne & Huddleston, 2002), i.e. the distinction between ‘individuals’ and ‘sets of individuals’ (Kouider *et al.*, 2006). This contrast is expressed in the form of lexical quantifiers (Kouider *et al.*, 2006) and presents a wide cross-linguistic variety as number marking can be either restricted to nouns or also expressed in noun-associated forms through patterns of number agreement, such as in the morphosyntactic properties of verbs, adjectives, and determiners (Di Garbo, 2020; Kouider *et al.*, 2006).

In the domain of language acquisition, the number concord property, although vastly investigated in the fields of L1 and L2, remains scarcely researched within the domain of L3A (Ben Abbes, 2016). In this scenario, the following subsections focus on the number concord expression in English, Norwegian, and Spanish, providing an overview of the number marking on each individual language, as well as of their cross-linguistic similarities and differences. For the means of the present research on adult L3A, number concord on definite articles will be focused since determiners present a key function in number marking, as they characteristically express quantification (Payne & Huddleston, 2002).

3.2.1 Number concord in English

English marks the plural number morphology on nouns, in which regular cases are represented by the suffix *-s* (Ben Abbes, 2016; Payne & Huddleston, 2002; Rothman *et al.*, 2010). The expression of singularities and pluralities on English nouns is an obligatory grammatical feature (Corbett, 2000; Rusk *et al.*, 2020; Wiltschko, 2008) since “whenever a (count) noun is used in a sentence, a decision must be made as to whether the value of number is set for singular or plural” (Wiltschko, 2008, p. 639), as illustrated in (19) below.

- (19) a. The three boy-s
b. *The three boy

(Wiltschko, 2008, p. 642)

While English nouns inflect for number, adjectives do not express singularity or plurality features (Ben Abbes, 2016; Rothman *et al.*, 2010) and determiners present a limited number concord within the DP (Ben Abbes, 2016). Among the determiner class, only demonstratives

agree in number with the head noun (e.g. *this/these* and *that/those*), as English articles (e.g. *the/a/an*) do not inflect for plural (Ben Abbes, 2016), as exemplified in (20) for definite DPs.

- (20) a. The blue pen (singular/definite)
b. The blue pens (plural/definite)

(adapted from Ben Abbes, 2016, p. 102)

3.2.2 Number concord in Norwegian

In Norwegian, the plural number morphology is marked on nouns, adjectives, and determiners (Faarlund *et al.*, 1997). The singular/plural distinction on nouns is expressed by the means of suffixes, which further categorizes the noun's (in)definiteness (Faarlund *et al.*, 1997; Halmøy, 2008). Based on the number and definiteness categories, most Norwegian plural lexical nouns present two main distinct forms: the indefinite plural *-er*, and the definite plural *-ene* (Halmøy, 2008), as exemplified in (21) below.

- (21) a. Jeg vet at det fins elg-**er** her.
I know that there exist elk-PL.INDEF here.
'I know there are elks here.'
b. Elg-**ene** var så tamme at vi kunne klappe dem.
elk-PL.DEF were so tame that we could clap them
'The elks were so tame that we could pat them.'

(adapted from Halmøy, 2008, p. 185)

The number concord on adjectives is also generally expressed through the realization of a suffix, in which the *-e* suffix marks the plural form (Faarlund *et al.*, 1997, 2019; Halmøy, 2008), as illustrated in (22).

- (22) a. Vi har brun hest/*brun-**e** hest.
We have brown.MASC.SG horse.MASC /brown-PL horse.MASC
'We have a brown horse'
b. Vi har brun-**e** hest-**er**/*brun hest-**er**.
We have brown-PL horse-INDEF.PL /brown.MASC.SG horse-INDEF.PL
'We have brown horses'

(adapted from Halmøy, 2008, p. 193)

In regard to determiners, plural marking is expressed both in demonstratives (e.g. *disse.PL*), and articles. The Norwegian definite article has two forms, being either expressed as a suffix on the noun, as previously exemplified in (21b), or as an independent word realized through pre-posed free articles, as *den.FEM.MASC*, *det.NEUT*, *de.PL* (Dahl, 2008; Faarlund, 2019). The pre-posed free articles are used in noun phrases in which the definite noun is preceded by a modifying adjective or quantifier (Anderssen *et al.*, 2018; Dahl, 2008; Faarlund *et al.*, 1997; Halmøy, 2008; Lundquist *et al.*, 2020), as illustrated in (23).

- (23) a. **Den** store gutt-en.
 The.MASC big boy-MASC.DEF
 ‘The big boy’
- b. **Det** lille barn-et
 The.NEUT little barn-NEUT.DEF
 ‘The little child’ (adapted from Faarlund, 2019, p.22)
- c. **Disse/de** stor-e elg-ene
 These/ the big-PL elk-DEF.PL
 ‘These/those/the big elks’
 (adapted from Halmøy, 2008, p. 189)

As observable from (23), the definite article agrees with the noun for gender and number, while the adjective expresses the definite adjectival ending *-e* (Faarlund, 2019). The combination of the definite noun with a modifying adjective is preceded by a demonstrative or a definite article, causing, this way, definiteness to be marked twice (Halmøy, 2008). This type of construction is, therefore, termed ‘double definiteness’, as “the noun has the definite suffix in addition to the prenominal independent article” (Faarlund, 2019, p. 23). The syntactic structure of the Norwegian definiteness feature is considered to be relatively complex (Fábregas *et al.*, 2019), a fact that should be taken into consideration in the studies on the acquisition of definite articles number concord of Norwegian as a L2/Ln.

3.2.3 Number concord in Spanish

The Spanish language marks the plural number morphology on nouns, adjectives, and determiners, in which the plural is reliably and consistently expressed by means of the final morpheme *-s* (Arias-Trejo *et al.*, 2014; Ben Abbes, 2016), as exemplified in (24).

- (24) a. Los sombreros negros.
 The.MASC.PL hat.MASC.PL black.MASC.PL
 ‘The black hats’
- b. Las chaquetas negras.
 The.FEM.PL jacket.FEM.PL black.FEM.PL
 ‘The black jackets’

(adapted from Ben Abbes, 2016, p. 101)

As illustrated in (24), Spanish adjectives and determiners show both gender and number concord with the head noun (Ben Abbes, 2016), which characterizes the plural morphology system with redundant agreement markers (Arias-Trejo *et al.*, 2014; Marrero & Aguirre, 2003). In regards to determiners, the Spanish articles are divided by gender (MASC/FEM), definiteness (DEF/INDEF), and grammatical number (SG/PL), as summarized in Table 5.

Table 5 - Distribution of Spanish articles by gender and definiteness.

	Singular		Plural	
	Masc.	Fem.	Masc.	Fem.
Definite	El	La	Los	Las
Indefinite	Uno	Una	Unos	Unas

Source: adapted from Ben Abbes (2016, p. 100).

Summary of the number concord property

As presented in the previous subsections (3.2.1 to 3.2.3), number concord is part of the syntactic representation of English, Norwegian, and Spanish. Nevertheless, the languages in study present cross-linguistic variations on whether the plural morphology is marked on specifiers such as adjectives and determiners. In this context, while all three languages presented mark nouns for plural, only Norwegian and Spanish also display number concord on adjectives and determiners. Therefore, in sum, Norwegian and Spanish behave linguistically alike in terms of number concord as compared to English, as summarized in Table 6.

Table 6 - Summary of number concord encoding in English, Norwegian, and Spanish.

Number concord (plural marking)	English	Norwegian	Spanish
Nouns	✓	✓	✓
Articles	✗	✓	✓
Adjectives	✗	✓	✓

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

In the context of the present study, the similarities and differences between the article number concord in the analyzed languages can be schematic represented as follows:

$$L3 \text{ NOR} = L1 \text{ ESP} \neq L2 \text{ ENG}$$

3.3 Adjective placement: cross-linguistic variation

Adjectives may be defined as “a syntactically distinct class of words whose most characteristic function is to modify nouns” (Pullum & Huddleston, 2002, p. 527). This class of words generally denotes properties such as size, shape, color, worth, and age (Pullum & Huddleston, 2002). In linguistics, one major topic in the study of adjectives is ordering (Valois, 2006), since it is pointed as a complex property which entails both syntactic and semantic relations (A. Alotaibi & M. Alotaibi, 2017; Nicoladis & Rhemtulla, 2012; Valois, 2006).

In this manner, adjectives widely vary cross-linguistically, presenting distinct configurations on the basis of adjective placement (A. Alotaibi & M. Alotaibi, 2017). Based on the canonical position of adjectives, languages can be separated in two groups, namely languages characterized by a prenominal adjective placement (Adj-N) and languages with a post-nominal adjective placement (N-Adj) configuration (Alotaibi & Alotaibi, 2017; Rothman *et al.*, 2010; Valois, 2006). In addition to the canonical adjective placement, some languages allow certain adjectives to appear in either Adj-N or N-Adj position (A. Alotaibi & M. Alotaibi, 2017; Valois, 2006). The following subsections further develop the topic of adjective placement in the context of the English, Norwegian, and Spanish languages.

3.3.1 Adjective placement in English

In English, the canonical order of adjectives in modifier-noun constructions is prenominal (A. Alotaibi & M. Alotaibi, 2017; Nicoladis & Rhemtulla, 2012; Pullum & Huddleston, 2002; Valois, 2006; Van de Velde *et al.*, 2014), as exemplified in (25).

- (25) a. **Heavy** rain fell.
b. **Young** people change.

(Pullum & Huddleston, 2002, p. 526)

It is worth-mention that, in a few cases, modified adjectives do occur in post-nominal position, as in the case of certain quantifiers as in *nothing important* and *something different* (A. Alotaibi & M. Alotaibi, 2017; Nicoladis & Rhemtulla, 2012). Nevertheless, these type of adjectives are not part of the scope of this thesis.

3.3.2 Adjective placement in Norwegian

Similarly to other Germanic languages, such as English, adjectives in Norwegian canonically appear in prenominal position (Faarlund, 2019; Faarlund *et al.*, 1997; Van de Velde *et al.*, 2014), as illustrated in (26).

- (26) a. Et **knust** glass.
A.NEUT broken glass.NEUT
'A broken glass'
b. En **stor** bil.
A.MASC big car.MASC
'A big car'

(adapted from Faarlund, 2019, p. 56)

3.3.3 Adjective placement in Spanish

Adjectives are canonically post-nominal in Spanish, a general characteristic of Romance languages (Rothman *et al.*, 2010; Van de Velde *et al.*, 2014). Nevertheless, due to Spanish's 'flexible' word order, certain alternations in the canonical word order are possible, as exemplified in (27). This flexible word order allows many adjectives to alternate between a pre- and a post-nominal position (Lozano, 2014; Rothman *et al.*, 2010), in special a large set of, but not all, evaluative adjectives (Rothman *et al.*, 2010). These type of adjectives "typically involve

subjective scales” (Androutsopoulou *et al.*, 2006, p. 2), such as *bueno* ‘good’, *malo* ‘bad’, and *agradable* ‘pleasant’ (Lozano, 2014).

(27) a. Los bomberos **valientes**.

The firefighters brave

‘The brave firefighters’ (i.e., *Those firefighters who are brave*)

b. Los **valientes** bomberos.

‘The brave firefighters’ (i.e., *All firefighters are brave*)

(adapted from Lozano, 2014, p. 289)

It is noteworthy that, despite the flexibility, the adjective alternance between pre- and post-nominal positions is constrained by semantic and information structure factors (Lozano, 2014). Although adjectives can keep a single lexical meaning regardless of being pre- or post-nominally placed, some of them can display distinct interpretive properties based on their syntactic position (Rothman *et al.*, 2010). As observable from (27), while Spanish evaluative adjectives in the post-nominal position (27a) have a restrictive, set-denoting reading, that is, the adjective denotes only a subset of the referred entities of the set, the pre-nominal placement (27b) evokes a non-restrictive, kind-denoting interpretation, that is, the adjective applies to all possible entities of the set referred to by the noun (Lozano, 2014; Rothman *et al.*, 2010; Van de Velde *et al.*, 2014). Besides, not all adjectives possess a flexible placement property. Non-evaluative adjectives denoting characteristics such as shape, nationality, color, and size appear only post-nominally in Spanish (Lozano, 2014), as in (28).

(28) a. Una mesa **redonda**.

A table round

‘A round table’

b. *Una **redonda** mesa.

‘A round table’

(adapted from Lozano, 2014, p. 288)

c. Las cortinas **italianas**

The curtains Italian

‘The Italian curtains’

d. *Las **italianas** cortinas

‘The Italian curtains’

(adapted from Rothman *et al.*, 2010, p. 54)

Summary of the adjective placement property

As briefly presented in the previous subsections (3.3.1 to 3.3.3), languages can be divided in two distinct groups based on the adjective placement. While modern Germanic languages present a canonical prenominal adjective syntactic placement, Romance languages have the post-nominal position as the surface structure. In this context, English and Norwegian, both Germanic languages, behave linguistically alike in terms of the canonical adjective placement, while Spanish, even though it allows a large set of adjectives to freely alternate between pre- and post-nominal positions, is characterized by a canonical post-nominal adjective placement. The cross-linguistic contrast in adjective–noun word order between these languages is summarized in Table 7.

Table 7 - Summary of the canonical adjective placement encoding in English, Norwegian, and Spanish.

Canonical adjective placement	English	Norwegian	Spanish
Prenominal (Adj-N)	✓	✓	✗
Post-nominal (N-Adj)	✗	✗	✓

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

In the context of the present study, the (dis)similarities between the canonical adjective placement in the analyzed languages is schematic represented as follows:

$$L3 \text{ NOR} = L2 \text{ ENG} \neq L1 \text{ ESP}$$

3.4 Subject pronoun expression: cross-linguistic variation

Subjects are typically employed in order to express the agent of the sentence, if there is one, and express the most topical element of the sentence, that is, what the sentence is about (Faarlund & Hagemann, 2014). The subject pronoun expression presents an extensive cross-linguistic variation, contrasting from mandatory, optional, or empty expression conditions in distinct natural languages (Valian, 2016). From a generative perspective, the subject expression set of a language can be described by the null-subject parameter (NSP, Chomsky, 1981), which presents the binary values of [+ null subject], or pro-drop, and [– null subject], or non-pro-drop, that explain the syntactic licensing of pronominal subjects (Rothman & Cabrelli Amaro, 2009).

The NSP phenomena is a highly researched syntactic feature on L2 and L3 acquisition (Tavakol & Jabbari, 2014; Valian, 2016) since it is pointed as a complex feature which is influenced by grammatical, semantic, pragmatic, cognitive, and socio-dialectal factors (Tavakol & Jabbari, 2014). In light of this, the following subsections explore the NSP in English, Norwegian, and Spanish, both on individual and cross-linguistic levels, with a special focus on expletive and referential subjects.

3.4.1 Subject pronoun expression in English

The English language presents a fairly rigid word order in which, aside imperative constructions, subjects are obligatorily overtly expressed (Judy & Rothman, 2010; Tavakol & Jabbari, 2014; Valian, 2016). From the NSP generative perspective, then, English is set as a [–null-subject], also referred in the literature as a non-pro-drop language, in which null subjects, i.e. “the absence of an overt subject before a verb that is tensed” (Valian, 2016, p. 386), are not licensed. English is the most studied example of [– null subject] language (Valian, 2016), with most NSP research specially focusing on two types of constructions, namely expletives and embedded clauses (e.g. Rothman & Cabrelli Amaro 2009; Tavakol & Jabbari, 2014; Valian, 2016).

Expletive subjects are typically found with meteorological expressions (Platzack, 1987) and existential sentences (Faarlund, 2013; Platzack, 1987), as exemplified in (29). Their only function is to fill in the subject position (Valin, 2016) since, by definition, this type of subject is semantically empty (Svenonius, 2002). English, as a [– null subject] language, require overt expletive subjects for full grammaticality (29a), being null expletive subjects (29b) infelicitous structures (Valian, 2016).

- (29) a. **It** is raining.
b. * \emptyset is raining.

(adapted from Valian, 2016, p. 387)

Likewise, English displays a restriction on the extraction of subjects of embedded clauses (Bentzen, 2014; Judy & Rothman, 2010; Rothman & Cabrelli Amaro 2009; Valian, 2016). Null referential subjects are ungrammatical in English embedded clauses (30) (Judy & Rothman, 2010; Rothman & Cabrelli Amaro, 2009), and are typically not allowed even in casual speech (Valian, 2016).

- (30) a. The lady says that **we** are very intelligent.
 b. *The lady says that **Ø** are very intelligent.
- c. I know that **I** love you.
 d. *I know that **Ø** love you.

(adapted from Rothman & Cabrelli Amaro, 2009, p. 12)

3.4.2 Subject pronoun expression in Norwegian

In Modern Norwegian, overt subjects are obligatory, except for imperative constructions (Faarlund, 2013; Faarlund & Hagemann, 2014; Kinn, 2016). In the NSP generative perspective, Norwegian is then set as a [- null subject] language, as both non-referential and referential subjects must be overtly expressed (Kinn, 2016). As illustrated in (31) for expletive structures, the overt non-referential subjects have the form *det* ‘it’ in most Norwegian dialects (Kinn, 2016). In Modern Norwegian, “subjects must be topics at all cost [...] and if there is no pragmatically suitable subject candidate, an expletive has to fill the role of subject” (Faarlund & Hagemann, 2014, p. 310).

- (31) a. På søndag regnet **det**.
 On Sunday rained it.
 ‘On Sunday it rained.’
- b. *På søndag regnet **Ø**.
 On Sunday rained Ø
 ‘On Sunday Ø rained.’

(adapted from Kinn, 2016, p. 278)

Similarly, embedded clauses in Norwegian (32) display overt referential subjects, being null referential subjects ungrammatical (Kinn, 2016; Rosenkvist, 2009).

- (32) a. Han sier at **han** ikke kan komme.
 He says that he not can come
 ‘He says that he cannot come.’
- b. *Han sier at **Ø** ikke kan komme.
 He says that Ø not can come
 ‘He says that Ø cannot come.’

(adapted from Kinn, 2016, p. 278)

3.4.3 Subject pronoun expression in Spanish

The Spanish language allows structures with either overt or null subjects, being, this way, characterized as a [+ null subject] language (Judy & Rothman, 2010; Quesada, 2014; Rothman & Cabrelli Amaro 2009; Tavakol & Jabbari, 2014; Valian, 2016). Nevertheless, even though overt subjects are not syntactically obligatory, the choice between overt and null subjects is not based on free variation, but reliant on contextual constraints such as contrastivity, emphasis, reference switch, or new information introduction (Judy & Rothman, 2010; Quesada, 2014).

In this way, while virtually any sentence carries the option of displaying null subjects, some sentences must appear without a subject (Valian, 2016). One example of the latest is found in Spanish expletives, which obligatorily require a null subject (Judy & Rothman, 2010; Quesada, 2014), as illustrated in (33).

- (33) Ø Lluvea menudo en abril.
Ø rains frequently in April
'It rains frequently in April.'

(adapted from Judy & Rothman, 2010, p. 200)

In regards to embedded clauses, subjects can be either null or overt in Spanish (Judy & Rothman, 2010), being the choice of subject pronoun type generally associated with distinct referential interpretations. As exemplified in (34a), the null subject tends to be employed in embedded clauses when the subject entity referred to in the embedded clause and the entity expressed in the matrix clause are the same (Valian, 2016). On the other hand, the employment of overt subject pronouns in Spanish embedded clauses tends to signal a contrast, that is, a reference switch (Holmberg *et al.*, 2009; Quesada, 2014), as exemplified in (34b).

- (34) a. Juan_i cree que Ø_i ganará el premio.
Juan believe-3rd.SG.PRES that Ø win-3rd.SG.FUT the prize
b. Juan_i cree que él_j ganará el premio.
Juan believe-3rd.SG.PRES that he win-3rd.SG.FUT the prize
'John thinks that he will win the prize'

(adapted from Quesada, 2014, p. 255)

Summary of the subject pronoun expression property

As previously presented in the subsections 3.4.1 to 3.4.3, languages can be divided in two main groups in regards to the NSP settings, namely [- null subject] and [+ null subject]. In this context, English and Norwegian, both Germanic languages, share the NSP configuration of [- null subject], or non-pro-drop languages, as their syntactic configuration does not permit the grammatical occurrence of null subjects. Oppositely, Spanish, a Romance language, is set as [+ null subject], or a pro-drop language, in which null subjects are not only allowed, but obligatory in specific contexts, such as in expletive subjects of meteorological expressions and in embedded clauses with co-referential subjects with the matrix clause. The cross-linguistic contrast of the NSP property in these languages is summarized in Table 8.

Table 8 - Summary of the null subject parameter encoding in English, Norwegian, and Spanish.

Null subject parameter	English	Norwegian	Spanish
[- null subject]	✓	✓	✗
[+ null subject]	✗	✗	✓

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

In the context of the present study, the similarities and differences between the NSP in the analyzed languages is schematic represented as follows:

$$L3 \text{ NOR} = L2 \text{ ENG} \neq L1 \text{ ESP}$$

4 The present study

As previously presented in section 3, the current study aims to investigate the CLI in the acquisition of L3 Norwegian morphosyntax by adult sequential L1 Spanish – L2 English speakers. For that, the research focus on the acquisition of four distinct linguistic properties, (a) post-nominal possessives gender agreement, (b) article number concord, (c) adjective placement, and (d) subject pronoun expression. The guiding research questions and predictions of this research are presented as follows.

4.1 Research questions and predictions

Considering the substantial body of research on the subject and the ongoing debate regarding the source and nature of CLI in L3A, this study is guided by the two main following research questions:

RQ 1: Which of the previously acquired languages is the source of cross-linguistic influence in adult third language acquisition? i.e. is the source of transfer driven by the (i) language status (order of acquisition) or (ii) the typological proximity between the L3 and L1/L2?

RQ 2: Is the cross-linguistic influence on adult third language acquisition of holistic or property-by-property nature?

Based on the five main competing hypotheses on the source and nature of CLI in the L3A (see section 2.4) and given the morphosyntactic properties and languages in investigation in this study, the following predictions are formulated:

- Bilingual Spanish – Norwegian (L1 SPA – L2 NOR) controls are expected to perform at ceiling in the treatment of post-nominal possessives gender agreement and definite article number concord due to the similarity of features between their L1 SPA and L2 NOR. Conversely, this group is predicted to transfer the adjective placement and subject pronoun expression features from L1 SPA to L2 NOR. In this context, the Spanish bilinguals are expected to perform with higher target-like ratings in the possessives and number concord items as compared to the English bilingual counterparts. In a similar vein, they are predicted to perform with lower scores in their treatment of Norwegian adjective placement and SPE as compared to the English controls.

- Bilingual English – Norwegian (L1 ENG – L2 NOR) controls are predicted to perform at ceiling in the judgment of adjective placement and subject pronoun expression items due to structural similarities between their L1 ENG and L2 NOR. On the other hand, this group of speakers is expected to perform with comparatively lower target-like ratings in the post-nominal possessives gender agreement and definite article number concord properties since these features are absent in their L1 ENG. As compared to the Spanish bilingual counterparts, thus, the English controls are predicted to achieve a higher target-like manner in their treatment of the Norwegian adjective placement and SPE, whereas performing at lower ratings in the judgement of possessives gender agreement and number concord.
- **H₁ - The L1 Factor (L1F):** Following this factor (Hermas, 2010, 2014), the L1 is the predominant source of CLI in the L3A. In the context of the present study, therefore, the Spanish multilinguals are expected to perform in target-like manner in the post-nominal possessives gender agreement and definite article number concord properties since L1 Spanish shares similar features to L3 Norwegian. On the other hand, this group would achieve comparatively lower target-like scores in the adjective placement and subject pronoun expression properties, as, differently from L3 Norwegian, adjectives predominantly occur post-nominally in Spanish and the language is set as [+ null subject]. In this scenario, the multilingual group is expected to perform with similar rates to the bilingual Spanish controls in all four morphosyntactic structures tested, as it will transfer features exclusively from Spanish, even when English is the language to display similar features to L3 NOR.
- **H₂ - The L2 Status Factor (L2SF):** According to this model, the CLI in L3A occurs from the L2. The L2SF model (Bardel & Falk, 2007; Falk & Bardel, 2011), then, predicts the Spanish multilinguals to behave in a less target-like manner in the post-nominal possessives gender agreement and definite article number concord properties as compared to their performance in the adjective placement and SPE conditions. This scenario is based on the fact that transfer would occur solely from the L2 English, in which the gender and definite article number concord features are absent. As a consequence, this model would predict the multilingual Spanish group to be outperformed by the bilingual Spanish controls in the treatment of possessives gender agreement and number concord items. Conversely, the multilingual group would achieve a target-like performance in the treatment of adjective placement and SPE as their L2 English presents similar settings to L3 Norwegian, therefore performing with

similar rates to the bilingual English controls. In addition, in regard to L2 proficiency, the L2SF model predicts speakers with a higher L2 proficiency to transfer more L2 features than those with a lower L2 proficiency. Therefore, advanced L2 English speakers should outperform those of lower-intermediate level in the rating of the adjective placement and subject pronoun expression properties. On the other hand, the L2SF model expects no difference on the basis of L2 proficiency in properties that are absent in the L2, i.e. post-nominal possessives gender agreement and definite article number concord.

- **H₃ - The Typological Primacy Model (TPM):** In this model, the typological similarity between the L1/L2 and the L3 is the key factor in determining which of the previous acquired languages is the one transferred, i.e. the typologically closest language to the L3 is transferred on a holistic basis. In the linguistic scenario of the present thesis, then, the TPM (Rothman, 2011, 2013, 2015) predicts L1 SPA – L2 ENG – L3 NOR speakers to transfer all the L2 English properties to the L3 Norwegian grammar since English is typologically closer to Norwegian (both are Germanic languages) as compared to Spanish (a Romance language). From this perspective, they are expected to perform in target-like manner in the adjective placement and subject pronoun expression properties as both features are present in their L2 English. Conversely, these speakers are presumed to be less-target-like in their treatment of post-nominal possessives gender agreement and definite article number concord since these features are absent in English. In this scenario, the multilingual group is expected to perform with similar rates to the English bilingual group in all four morphosyntactic structures tested, as it will transfer features exclusively from English, even when Spanish is the language to display similar features to L3 NOR.
- **H₄ - The Cumulative Enhancement Model (CEM):** As stated by this model, the CLI on L3A can occur from either or both the L1 and L2, being either facilitative or remaining neutral. In the linguistic context of the present thesis, then, the CEM (Flynn *et al.*, 2004) expects Spanish multilinguals to perform at similar ratings to Spanish bilinguals in the properties of post-nominal possessives gender agreement and definite article number concord due to the facilitative influence of Spanish. Since CLI in this model is either facilitative or neutral, English is not expected to play any role in the ratings of these features. Likewise, the multilinguals are predicted to display a similar performance to English bilinguals in regards to the adjective placement and subject pronoun expression due to the facilitative influence of English. Once again,

as non-facilitative CLI is not accounted in the CEM, Spanish is not expected to influence in the judging of these items.

- **H5 - The Linguistic Proximity Model (LPM):** According to this model, the CLI can be derived from both the L1 and L2, as language acquisition is a cumulative process. In this way, the LPM advocates for a property-by-property transfer, in which both facilitative and non-facilitative CLI are possible. Facilitative transfer is based on the structural similarity of previously acquired languages and the L3, while non-facilitative transfer is possible as an outcome of (i) speakers' incorrect assumption that a linguistic property is shared between one of the previously acquired language and the L3, (ii) insufficient input, or (iii) due to the co-activation of competing related structures of both previously-acquired languages. According to the LPM (Westergaard *et al.*, 2017), then, the Spanish multilinguals are expected to outperform the English bilingual controls in the treatment of possessives gender agreement and number concord due to access to Spanish. Nevertheless, in these properties, the multilinguals may score at lower ratings as compared to the Spanish bilingual controls due to non-facilitative influence from English. Oppositely, the Spanish multilinguals are predicted to outperform the Spanish controls in the ratings of adjective placement and subject pronoun expression due to facilitative English influence, but may score lower than the English controls due to non-facilitative CLI from Spanish.

A summary of the predictions based on each L3A model is displayed in Table 9 below.

Table 9 – Predictions on the source and type of CLI in the performance of the current study's L3 Norwegian learners by linguistic model and condition.

	POSS	NUM	ADJ	SPE
L1F	Spanish (F)	Spanish (F)	Spanish (N)	Spanish (N)
L2SF	English (N)	English (N)	English (F)	English (F)
TPM	English (N)	English (N)	English (F)	English (F)
CEM	Spanish (F)	Spanish (F)	English (F)	English (F)
LPM	Spanish (F) / English (N)	Spanish (F) / English (N)	English (F) / Spanish (N)	English (F) / Spanish (N)

Note: (F) – facilitative CLI; (N) – non-facilitative CLI.

5 Methods and procedures

This section presents the methods and procedures used in this study. A description of the methodology employed is given in subsection 5.1, followed by a detailed presentation of the various tasks that composed the study in subsection 5.2. The pilot study is given in subsection 5.3, and finally, the main study’s participants and procedures are covered in subsection 5.4.

5.1 Methodological approach

Considering the research questions and predictions detailed in the previous section, it was crucial to employ a methodology suitable for the investigation of CLI both as a potential holistic and property-by-property phenomenon in order to account for all the models tested. In this scenario, the method used in the present study was based on the subtractive experimental design (Westergaard *et al.*, forthcoming), which allows the identification of possible CLI from both previously acquired languages.

This method supports a clear separation of the possible influence from the L1 and L2 by the use of the referred ‘subtractive language groups’, summarized in Table 10. In this experimental design, “the performance of the L3 group is compared to L2 controls – where the target language is kept constant, but the other languages are varied parametrically” (Westergaard *et al.*, forthcoming, p.12). In this manner, the experiment also allows the study of the type of CLI, i.e whether the influence is only facilitative or both facilitative and non-facilitative.

Table 10 - Combinations of properties to be investigated in the subtractive experimental design.

	Property 1 $L_C = L_A \neq L_B$	Property 2 $L_C = L_B \neq L_A$
$L_A - L_C$ group	L_A group >> L_B group	
$L_B - L_C$ group		L_B group >> L_A group
$L_A - L_B - L_C$ group	Facilitation from L_A , non-facilitation from L_B	Facilitation from L_B , non-facilitation from L_A

Source: adapted from Westergaard *et al.* (forthcoming, p.13).

In the subtractive experimental design (Westergaard *et al.*, forthcoming), the choice of tested properties is of uttermost importance. Since learners can experience facilitation regarding

grammatical properties that present similar features from their previously acquired languages as compared to those who acquire a property with features that are either different or not present in the languages they have previously acquired, employing a combination of contrasting properties between L1 and L2 allows the isolation of the possible influence from each language. Interestingly, this method can also be employed as a mean to highlight “that even closely related languages exhibit differences in their systems [...], while languages from different language families may exhibit important similarities” (Fabricius-Hansen *et al.*, 2017, p. 20).

As previously presented, in the domain of L3A research, very few studies have addressed the investigation of more than one or two grammatical properties (see Ben Abbes, 2016, 2020; Abbes *et al.*, 2021 for exceptions). In order to fill in this gap, the present study contributes to the body of research by proposing the investigation of four distinct morphosyntactic properties (see sections 3.1 to 3.4 for details), further summarized in Table 11.

Table 11 - Presence vs absence of the tested morphosyntactic properties.

Property	Combination of properties	L1 Spanish	L2 English	L3 Norwegian
(1) Post-nominal possessives gender agreement	L3 = L1 ≠ L2 Properties (1) & (2)	✓	✗	✓
(2) Number concord on DET		✓	✗	✓
(3) Canonical ADJ-N placement	L3 = L2 ≠ L1 Properties (3) & (4)	✗	✓	✓
(4) [- null subject parameter]		✗	✓	✓

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

The tasks used in the subtractive experimental design of the present study are described as follows.

5.2 Experimental tasks

The present study was composed by three main types of experimental tasks, namely (a) a grammaticality judgment task (GJT), (b) a closed-ended questionnaire on participants’ perception of language proximity (assessed on a 7-point Likert Scale basis), and (c) language proficiency test(s). The GJT and Likert scale methods were selected since they are (i) two of

the most widely used methods on language acquisition research (Schmid, 2011), and (ii) considered to be intuitive, which implies that explicit practice sessions are generally not necessary to make participants familiarized with these type of tasks (Schütze & Sprouse, 2013).

In addition, a background questionnaire was presented to participants before the initiation of the tasks. The following subsections present the aforementioned tasks in detail, further developing on the employed methodology, sample size, and items' structures.

5.2.1 Background questionnaire

The questionnaire included two main types of questions, one regarding general information of participants, and the other relating to their linguistic background. General information requested involved age, gender, education, and length of residence in Norway. The linguistic background questions, in turn, required participants to inform about their native language, all possible previously learned languages and respective self-assessment proficiency levels, and the number of years they had been learning Norwegian.

The background questionnaire was employed in order to group participants according to their native language and knowledge of additional languages, as well as to assess in the possible exclusion of participants whose linguistic background was not part of the scope of the present study. The complete background questionnaire is provided in Appendix 1.

5.2.2 Grammaticality judgement task (GJT)

The grammaticality judgment task (GJT) is a binary judgment method in which participants are asked to rate stimuli sentences as grammatical or ungrammatical (Lozano, 2014; Schmid, 2011). In the present study, the GJT was applied as the first linguistic task of the study and responses were elicited in 'right' or 'wrong' format rather than 'grammatical' or 'ungrammatical' in an effort to make the task more familiar to participants.

The GJT was designed to detect quantitative differences between participants' rating choice based on distinct linguistic properties. The task included 64 target items equally distributed in four morphosyntactic properties. Each property contained 16 items, divided in 8 grammatical sentences and 8 ungrammatical sentences. In addition, 32 filler sentences were added to the GJT, i.e. items which are not related to the properties in study. These type of items were added in the experiment in order to reduce the chances of participants uncovering, or being aware of, the particular linguistic properties being tested, and were later further excluded from

the analysis. Besides, the filler sentences were used as control items to check whether participants correctly understood the task, that is, whether they were able to distinguish between uncontroversial grammatical items from uncontroversial ungrammatical ones (Bross, 2019).

The fillers were equally distributed among two categories, namely word-order and quantifier-noun agreement. Since fillers can influence on the ratings of the target items being judged (Bross, 2019), each category contained 16 items distributed in 8 grammatical sentences and 8 ungrammatical sentences. The purpose behind the use of both grammatical and ungrammatical filler items was to avoid participants from being biased, as the inclusion of either only highly acceptable or highly unacceptable filler sentences can lead participants to overuse one of the available responses (Bross, 2019). This way, the addition of both types of fillers was used as an effort to ensure that all possible responses would be selected equally often, therefore avoiding scale bias (Schütze & Sprouse, 2013). The 64 target and 32 filler items' order of display in the GJT was randomized and manual changes were made to assure items from the same morphosyntactic property would appear at least in a 2 items interval.

Finally, the vocabulary presented in the GJT was based on, but not exclusive to, the Norwegian Web Corpus 2017 (noTenTen 17, *Bokmål*). The frequency wordlists for verbs, nouns, and adjectives were especially consulted². The wordlists' search was constrained to the first 150 items of each list. The noTenTen corpus was used in an effort to employ in the GJT only target vocabulary that would be familiar to participants, therefore preventing the lack of lexical understanding from being an interfering factor on their rating judgement. Individual remarks on the four morphosyntactic properties' GJT items are presented as follows.

5.2.2.1 GJT items

The GJT items were designed to test participants' knowledge of the (a) nominal possessives agreement, (b) number concord, (c) adjective placement, and (d) subject pronoun expression morphosyntactic properties (see sections 3.1 to 3.4 for details), and to account for possible CLI on participants' ratings. Grammatical and ungrammatical items of each linguistic property were designed as minimal pairs, that is, with as little variation as possible between

² The original wordlists can be accessed in the Norwegian Web Corpus 2017, available at: <https://www.sketchengine.eu/notenten-norwegian-corpus/>

acceptable and unacceptable items. Each participant was presented with both the grammatical and ungrammatical versions of each sentence.

The nominal possessives items were designed to test participants' knowledge of the (un)grammaticality of Norwegian post-nominal possessives' gender agreement. The GJT's sentences featured masculine and neuter Norwegian nouns in the singular suffixed definite form, as respectively exemplified in (35a) and (36a). As Norwegian *Bokmål* is developing into a two-gender language (common gender and neuter), as discussed in subsection 3.1.2, historically feminine nouns were not included in the task in an effort to avoid possible dialect bias. On the other hand, all selected Norwegian nouns' equivalents in Spanish were feminine. Since masculine is the default gender in Spanish, this design choice was made in an effort to prevent L1 Spanish participants' ratings of items featuring masculine Norwegian nouns from being biased. Ungrammatical items were formed by a mismatch between the noun and the post-nominal possessive's gender agreement, as illustrated in (35b) and (36b).

(35) Sample test sentence for post-nominal possessive gender agreement (masc.)

a. Denne maten er min.

This.MASC food.DEF.MASC is mine.MASC

b. *Denne maten er mitt.

This.MASC food.DEF.MASC is mine.NEUT

'This food is mine.'

(36) Sample test sentence for post-nominal possessive gender agreement (neuter)

a. Dette rommet er ditt.

This.NEUT room.DEF.NEUT is yours.NEUT

b. *Dette rommet er din.

This.NEUT room.DEF.NEUT is yours.MASC

'This room is yours.'

The number concord items targeted participants' knowledge of plural marking morphology on definite articles. For this, the items were composed of Norwegian double definite forms since they possess pre-posed free articles in their structure (37a). It is noteworthy that all Norwegian adjectives equivalents in Spanish were evaluative adjectives that allow the pre-nominal position. In this way, the sentences' word-order was similar in all three languages under study. This design choice was made in an effort to prevent word-ordering from influencing participants' ratings, in special the ones whose L1 was Spanish, as the focus of

these items was in the definite article plural marking rather than on the adjective placement. Ungrammatical items were formed by the placement of singular pre-posed free articles in reference to plural nouns (37b).

- (37) Sample test sentence for number concord
- a. De nye professorene er på kafeen.
The.DEF.PL new professors.PL are in the canteen
 - b. *Den nye professorene er på kafeen.
The.DEF.SG new professors.PL are in the canteen
'The new professors are in the canteen.'

The adjective placement items elicited color (38) and nationality adjectives (39). The choice of these type of adjectives is justified by its word-order similitude with English (Adj-N), and dissimilarity with Spanish (N-Adj) since color and nationality adjectives can appear only post-nominally in Spanish (section 3.3.3). Ungrammatical items were, therefore, formed by N-Adj word-order, as exemplified in (38b) and (39b).

- (38) Sample test sentence for adjective placement (color)
- a. Jeg kjører en rød bil.
I drive a red car
 - b. *Jeg kjører en bil rød.
I drive a car red
'I drive a red car.'
- (39) Sample test sentence for adjective placement (nationality)
- a. Hun har en norsk genser.
She has a Norwegian sweater
 - b. *Hun har en genser norsk.
She has a sweater Norwegian
'She has a Norwegian sweater.'

The subject pronoun expression items were designed to test participants' knowledge of the (un)grammaticality of overt and null subjects in expletive and referential positions in Norwegian. Expletives items were composed of meteorological expressions and contained grammatical overt expletive subjects (40a) and ungrammatical null expletives subjects (40b).

Referential subjects were part of embedded clauses and similarly contained grammatical overt referential subjects (41a) and ungrammatical null referential subjects (41b).

(40) Sample test sentence for expletive subjects

a. Det regner mye i Norge.

It rains a lot in Norway

b. *Regner mye i Norge.

Ø Rains a lot in Norway

‘It rains a lot in Norway.’

(41) Sample test sentence for referential subjects

a. Faren sier at han er tørst.

The father says he is thirsty

b. *Faren sier at er tørst.

The father says Ø is thirsty

‘The father says he is thirsty.’

Finally, items targeting word-order (42) and quantifier-noun agreement (43) were added as fillers. Violations presented in the ungrammatical item set were infelicitous in all three languages in the study.

(42) Sample test sentence for word-order fillers

a. Han spiser brød

He eats bread

b. *Han brød spiser

He bread eats

‘He eats bread’

(43) Sample test sentence for quantifier-noun agreement fillers

a. Han sover tolv timer hver natt.

He sleeps twelve hours every night

b. *Han sover tolv time hver natt.

He sleeps twelve hour every night

‘He sleeps twelve hours every night’

The glossaries and translations presented in all examples provided in this section were used for readers' clarification purposes only and were not included in the actual task. The complete list of experimental and filler items of the GJT is provided in Appendix 2.

5.2.3 Closed-ended questionnaire

The closed-ended questionnaire, adapted from Ben Abbes (2016, 2020), was developed to investigate participants' perception of linguistic relatedness between their first, second and third languages. Specifically, the questionnaire tackles the perceived linguistic relatedness from (i) a psychotypical proximity perspective, i.e. from a holistic linguistic similarity scenario, in which a language pair shares the same family root and several linguistic features across distinct modules (e.g. lexicon, morphology, syntax) (Rothman, 2011, 2013, 2015), and (ii) a structural proximity perspective, in which the linguistic relatedness of a language pair is assessed in a property-by-property basis (Ben Abbes, 2016). In line with this, the questionnaire is especially suitable to address one highly debated question in the L3A field, as it can give further insights on whether CLI is holistically or property-by-property perceived (Ben Abbes, 2016, 2020). In addition, the questionnaire also addressed participants' perception regarding the learning difficulty level of each of the linguistic properties tested. In this context, the task also addressed the factor of individual linguistic properties' perceived complexity level as a potential influencing variable triggering CLI in the L3A.

The questionnaire was composed of 18 closed-ended items divided in four main question types which explicitly asked participants about their perception of (a) the similarity/difference between their L1, L2, and L3 in general, (b) the similarity/difference of the four studied morphosyntactic properties between their L1, L2, and L3, (c) the difficulty level of the four properties tested in L3 Norwegian, and (d) how helpful the knowledge of their L1/L2 was in the process of learning Norwegian.

All questions were presented in a multiple choice rating form, in which participants were provided with a 7-point Likert Scale option. The Likert Scale was planned to identify quantitative differences between participants' perception on linguistic proximity, and was employed in the experiment since it is one of the most commonly used numerical scale method in linguistic research (Schütze & Sprouse, 2013). The response scale was distributed as follows.

Option 1: Very difficult

Option 2: Difficult

Option 3: Slightly difficult

Option 4: Neither easy nor difficult

Option 5: Slightly easy

Option 6: Easy

Option 7: Very easy

The same scoring criteria were used for the remaining questions, regarding similarity/difference (i.e., 1-very different to 7-very similar) and agreement/disagreement levels (i.e., 1-strongly disagree to 7-strongly agree), by replacing the word ‘difficult’ by ‘different/disagree’ and the word ‘easy’ by ‘similar/agree’, respectively. The complete questionnaire used in the experiment is provided in Appendix 3.

5.2.4 Proficiency tests

In the present study, two language proficiency tests were employed, distributed according to the tested linguistic groups. A Norwegian proficiency test, which consisted of a 40-multiple-choice set regarding general knowledge of the Norwegian grammar (44), was presented to all participants whose first language was other than Norwegian.

- (44) Multiple choice task on Norwegian grammar (proficiency test) sample
- Hvor bor dere? ‘Where do you.PL live?’
- Dere kommer fra Italia. ‘You.PL are from Italia.’
 - Vi bor i Tromsø. ‘We live in Tromsø’
 - Dere bor i Tromsø. ‘You.PL live in Tromsø’
 - Lingvistikk. ‘Linguistics.’

The test was adapted from the Norwegian language course proficiency test³ for international students offered at The Arctic University of Norway’s (UiT), which originally consisted of 50-multiple-choice questions and was designed to assess students from levels A1-B1 following the Common European Framework of Reference for Languages (CEFR). A length

³ The original and complete test can be freely accessed at the Arctic University of Norway’s website: (<https://fr.uit.no/ressurs/uit/norskkurs/Plasseringstest.htm>).

adaptation was made in order to match the second language proficiency test and due to algorithmic length limitations of the form. The complete list of the adapted Norwegian proficiency test is provided in Appendix 4A.

In addition to the Norwegian proficiency test, a subset of the Standardized Oxford Proficiency Test was presented as the final linguistic task of the experiment for the Spanish multilingual target group. The English proficiency task was composed of 40 multiple-choice items divided in two equally distributed sets, which included 20 items targeting participants' general knowledge of the English grammar (45), and 20 items distributed in the format of a continuous narrative in which participants should fill in the gaps in order to maintain a coherent and logical flow (46). The test was designed to assess students from levels A1-C1 in a CEFR scale. The complete list of the used subset of the English Oxford proficiency test is provided in Appendix 4B.

(45) Multiple choice task on English grammar sample (proficiency test)

Water _____ at a temperature of 100° C.

a. is to boil

b. is boiling

c. boils

(46) Multiple choice task on continuous narrative format sample (proficiency test)

i. The history of _____ is

a. airplane

b. the airplane

c. an airplane

ii. _____ short one. For many centuries men

a. quite a

b. a quite

c. quite

Both tests were employed in order to group participants into different English and Norwegian proficiency levels, which would further allow the investigation of potential effects of non-native languages' proficiency in the CLI patterns in adult L3A of Norwegian. The proficiency tests were added as a complement to the language self-assessment presented in the background questionnaire, thus verifying participants' proficiency level by means of objective and subjective measures, respectively. It is worth of note that, differently from English, there

is yet no standardized proficiency test for the Norwegian language knowledge. The proficiency test from UiT was, then, preferred since it is currently one of the few university-based Norwegian placement tests fully available in online format.

5.3 The pilot study

The pilot study was conducted with manifold purposes. Firstly, the study was assigned to determine whether the experimental tasks and items were suitable for testing the chosen morphosyntactic properties and whether items were appropriate for participants' language level. Secondly, the pilot study was used as a mean to receive feedback on vocabulary and approximate length of the experiment. Finally, the study served to point whether participants would be able to convey that certain aspects of the items presented should not influence in their responses, such as the plausibility of the sentences' content, and the probability of the items being replicated in real life situations (Schütze & Sprouse, 2013).

A total of 6 participants (3 female, 3 male, mean age $M = 24$, age range 21-27) joined the pilot study, equally distributed in two L1 SPA - L2 ENG - L3 NOR learners, two L1 ENG - L2 NOR learners, and two L1 NOR native speakers. The piloted experimental design for the native Spanish and English learners of Norwegian was formed by the background questionnaire, the GJT, and the Norwegian proficiency test. Following the Norwegian proficiency test, the target Spanish multilingual group was formed by an elementary (A2) and a pre-intermediate (B1) level student, while the English bilingual control group was composed by two beginner (A1) level students based on the A1-C2 CEFR scale. Both Norwegian learning groups were especially appropriate to determine the GJT's difficulty level, that is, to point whether the items were considered too difficult or too easy for participants to rate.

The Norwegian native control group took part only in the background questionnaire (adapted, see Appendix 3) and GJT tasks. This group was included in the pilot experiment since a GJT pre-test with native speakers can elicit items which a non-native speaker might not have expected to be problematic (Schmid, 2011). All participants of the pilot study were recruited from the Arctic University of Norway (UiT), and were living in the city of Tromsø by the time of completion of the experiment. The group was formed by 5 masters and 1 bachelor student. None of the participants had a background in linguistics.

The results of the GJT are displayed in Table 12. After the completion of the pilot study, participants were asked to give feedback on the experiment. The feedback provided pointed the

GJT items were appropriate for participant’s Norwegian language proficiency levels as the task was considered ‘moderated’, that is, neither too difficult nor too easy. Instructions were regarded to be clear throughout the experiment and the vocabulary used was considered to be frequently used in daily and academic life. No further comments were received regarding the background questionnaire. Finally, minor changes in the GJT were made following participants’ feedback and score results. None of the participants who joined the pilot study took part in the main experiment.

Table 12 - Pilot study GJT’s mean scores sorted by group and condition.

	L1 SPA – L2 ENG (n = 2)	L1 ENG (n = 2)	L1 NOR (n = 2)
Possessives agreement	12.5/16 (78.12%)	8.5/16 (53.12%)	16/16 (100%)
Number concord	13.5/16 (84.37%)	9.5/16 (59.37%)	15.5/16 (96.87%)
Adjective placement	11/16 (68.75%)	15/16 (93.75%)	16/16 (100%)
Subject expression	14/16 (87.5%)	12.5/16 (78.12%)	16/16 (100%)
Word-order (Filler)	15.5/16 (96.87%)	13.5/16 (84.37%)	16/16 (100%)
Quantifier-noun (Filler)	10.5/16 (65.62%)	10/16 (62.5%)	16/16 (100%)

Note: L1 SPA – L2 ENG = L1 Spanish – L2 English – L3 Norwegian target group; L1 ENG = L1 English – L2 Norwegian control group; L1 NOR = L1 Norwegian native control group.

5.4 The main experiment

The present section describes how the main experiment of this thesis was conducted. Participants’ general characteristics and recruitment are detailed in subsection 5.4.1, and the experiment’s procedure is presented in subsection 5.4.2.

5.4.1 Participants

Participants of the main experiment of the study were recruited by means of two main approaches. In a first moment, formal requests to share the experiment’s invitation with international students were sent to six Norwegian universities. Upon agreement and formal permission, L1 SPA – L2 ENG – L3 NOR (target group) and L1 ENG – L2 NOR (control group) participants were recruited from Norwegian courses for international students (levels A1-A2 on the CEFR scale) at the Arctic University of Norway (UiT), in Tromsø, the Norwegian University of Science and Technology (NTNU), in Trondheim, and the University of Bergen (UiB). As the number of participants gathered with this approach was relatively

small, a new set of participants was recruited through social media. In this second moment, advertisements containing a brief description of the study were shared and interested candidates were individually contacted by the author of the experiment. Potential participants were asked about (a) their linguistic background, (b) Norwegian level, and (c) if they were currently living in Norway. These questions were set as a selection criteria in an effort to gather participants with a similar profile to the ones recruited at the Norwegian courses at universities. Only participants who met the criteria were further invited to join the experiment.

It is worth noting that, due to the Norwegian higher education entrance policy, international students who are not native English speakers must present an international English proficiency certificate (TOEFL or IELTS) with the minimum score equivalent to intermediate (B2) level in order to enroll in a Norwegian university. In this way, finding L1 SPA – L2 NOR participants in the academic environment within the Norwegian proficiency scope studied in the present thesis was not possible. Therefore, this control group was recruited solely through social media. Nevertheless, due to the linguistic reality of Norway, where English is used as a lingua franca in many international social and working environments, very few participants with this linguistic profile were found. This matter is further discussed in the Limitations section presented at the end of this thesis.

In sum, the present study tested 18 L1 SPA – L2 ENG – L3 NOR (14 female, 4 male, mean age $M=30.44$, age range 19-48), 5 L1 SPA – L2 NOR (5 female, mean age $M=37.2$, age range 23-56), and 13 L1 ENG – L2 NOR (8 female, 5 male, mean age $M=30.69$, age range 22-56). In accordance to the focus of the present thesis, which proposes an investigation on the source and nature of CLI in the L3A, none of the participants selected reported having knowledge of an additional language outside of the scope of each study group. As pointed by Ben Abbes' (2016, 2020) research, the inclusion of learners with more than one L3 makes it even more intricate and challenging to identify which of the background languages was the source of CLI and what factors have triggered the influence. In addition, the study included no first language bilinguals (2L1, e.g. Spanish – English), in a way that all tested participants were sequential bilinguals/multilinguals.

Similarly to the pilot study, in addition to the Norwegian learning participants, a group of native Norwegian speakers ($n=15$) was recruited from the Arctic University of Norway (UiT) in order to provide the native scores baseline. These participants were bachelor and master degree students from different areas of knowledge and were originally from different

Norwegian municipalities. In this manner, a total of 51 participants were included in the final analysis, distributed in the aforementioned four main groups. A summary of participants groups is displayed in Table 13. Further detail information about participants can be found in Appendix 5.

Table 13 - Linguistic profile of participants groups.

	L1	L2	L3	Total
Multilingual target group	Spanish	English	Norwegian	18
Bilingual control group 1	Spanish	Norwegian	N/A	5
Bilingual control group 2	English	Norwegian	N/A	13
Native control group	Norwegian	N/A	N/A	15

5.4.2 Procedure

All tasks of the main experiment were distributed in online format through the Microsoft Forms platform and stimuli sentences were visually presented with no time limit for responses. Participants completed the tasks in a single session using their own devices and at a place and time of their choice. Before starting the experiment session, participants were informed about the study, the type of tasks they were expected to perform, approximate length of the experiment, and how their personal data would be managed. The experiment was approved by the Norwegian Center for Research Data (NSD) – application n° 163316 - and followed the guidelines regarding personal data processing. All participants provided informed consent to take part in the study.

As described in section 5.2, all participants answered to the background questionnaire before starting the linguistic tasks. Multilingual Spanish participants, as well as both bilingual English and Spanish control groups, performed the GJT and the Norwegian proficiency test. The multilingual Spanish group, in addition, completed the closed-ended questionnaire on language proximity and the English proficiency test. The Norwegian native group, similarly to the pilot study, performed only the GJT in addition to the background questionnaire. All participants received the same sequence of questions in all tasks and were rewarded with an

online gift card⁴ upon completion of their participation. The average time taken for the completion of the experiment was of 45 minutes.

⁴ The rewards were funded by grants received from The Institute of Language and Culture (ISK, Institutt for språk og kultur) and the Acqva Aurora research group, both based at The Arctic University of Norway (UiT).

6 Results

The gathered data of this study was analyzed through R Studio (R Core Team, 2020). In this section, a detailed description of the results obtained and their analyses are presented. Subsection 6.1 accounts for the results gathered from the background questionnaire. Subsection 6.2 provides participants' proficiency scores in English and Norwegian, a factor which is further investigated in subsection 6.3 on the GJT comparative analysis of participants' performance and subsection 6.4, which focuses on the closed-ended questionnaire results.

6.1 The background questionnaire

Previously to the analysis of the linguistic tasks employed in the current study, a brief investigation of the possible effects of subjects' general (social) linguistic and biological data over their accuracy ratings was conducted. As presented in section 5.2.1, the background questionnaire included two main types of questions, mainly regarding general information of participants, such as gender, age, and highest level of education, and sociolinguistic related aspects, such as the length of Norwegian study and residence in Norway.

The statistical tests' results returned the following: no significant interaction between accuracy and subjects' gender ($p > .05$) or highest level of education ($p > .05$ for all six variables) were found. In a similar vein, no significant correlation was attested between participants' age and accuracy ($r_t = -.061$, $p > .05$), a somewhat not surprising finding as one's knowledge of an additional language may not necessarily depend on one's age, in special when all subjects' share a similar range of age of onset in terms of Norwegian learning, i.e. during adulthood. Finally, as shown in Figures 1 and 2, no significant correlation was found between participants' performance and (i) the extent of residence in Norway nor (ii) the length of Norwegian study. In regards to these two variables, moreover, Kendall's' test for rank correlation tau found weak, non-significant values (i) between participants' length of Norwegian study and proficiency level in this language ($r_t = .18$, $p > .05$), and (ii) between the extent of residence in Norway and Norwegian proficiency ($r_t = -.23$, $p > .05$). These results could help to understand the lack of correlation between both the length of study and residence and subjects' performance.

The syntax and output of the statistics results on the background questionnaire data are presented in Appendix 6.

Figure 1 - Correlation between Norwegian learners' length of residence in Norway and accuracy.

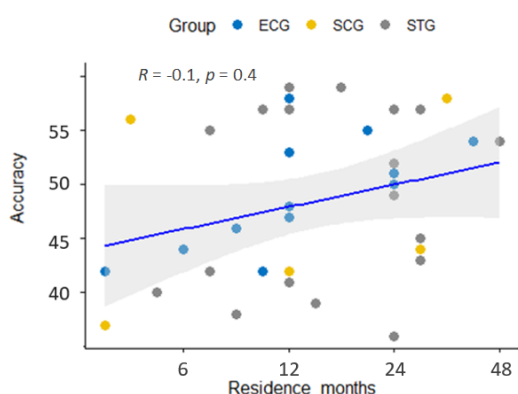
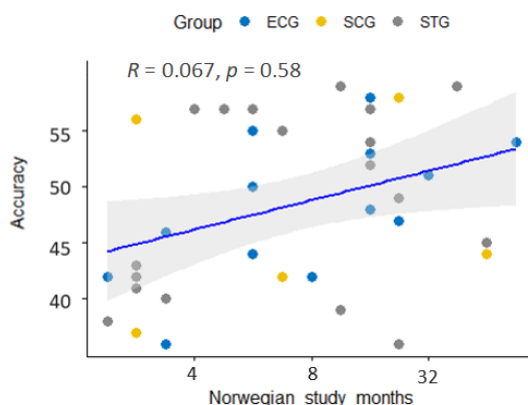


Figure 2 - Correlation between learners' Norwegian length of study and accuracy.



Note: ECG = English control group (L1 ENG – L2 NOR); SCG = Spanish control group (L1 SPA – L2 NOR); STG = Spanish target group (L1 SPA – L2 ENG – L3 NOR).

6.2 The proficiency tests

Participants' Norwegian proficiency level was measured by means of an adaptation of the Norwegian placement test provided by the Arctic University of Norway (UiT), as previously detailed in section 5.2.4. The test's range of score was 1-40 and it was divided as follows: learners who scored 23 or below were considered beginners (A1), while those who scored between 24-31 were placed as elementary (A2) learners. Finally, the ones to score 32-40 (80% or above) were considered pre-intermediate learners. As noticeable, this proficiency test has a limitation of placing participants from levels A1 to B1 only, a limitation which is further discussed in the conclusion of this thesis (see section 8). In view of this, participants were also asked for a self-assessment of their Norwegian level in an effort to prevent too advanced students from taking part in the experiment. All non-native Norwegian speakers to participate provided a self-assessment of Norwegian language level of A1-A2 following the CEFR scale. Table 13 displays the mean score, range, and standard deviation of participants' scores sorted by linguistic group.

Table 14 - Linguistic groups and their Norwegian proficiency scores.

Linguistic group	N	Mean	Range	SD
L1 SPA – L2 ENG	18	29.5	13-38	6.986
L1 SPA	5	27.4	12-38	9.707
L1 ENG	13	26.61	18-35	5.942

In order to test whether the groups were comparable in terms of Norwegian proficiency, a one-way ANOVA test was performed (see Appendix 7A). Results pointed there was no significant difference between the three linguistic groups in regards to their overall proficiency scores in the Norwegian test ($F(2,33) = [0.831]$, $p = 0.442$; $p > .05$), indicating the linguistic groups were comparable in terms of Norwegian proficiency. Moreover, a Bartlett test of homogeneity of variances (see Appendix 7B) similarly returned a high p -value ($p = 0.489$), pointing the variability of Norwegian proficiency levels within the three linguistic groups was also comparable across groups. As shown in Table 14 above, the Norwegian proficiency score for all non-native participants in this study was within the range of 12-38, meaning the experiment counted with learners from all the test's available levels. Based on this, participants were further grouped into beginner ($n = 10$, score range 12-22), elementary ($n = 11$, score range 24-31), and pre-intermediate ($n = 15$, score range 31-38) level learners. The division of participants by linguistic group and Norwegian proficiency scores is displayed in Table 15 below.

Table 15 - L2 and L3 learners grouped by Norwegian proficiency levels.

Linguistic group	Norwegian proficiency	N	Mean	Range	SD
L1 SPA – L2 ENG ($n = 18$)	Beginner	4	18.75	13-22	3.491
	Elementary	5	28.00	24-31	2.366
	Pre-intermediate	9	35.11	31-38	2.233
L1 SPA ($n = 5$)	Beginner	2	17.00	12-22	5.000
	Elementary	1	28.00	28	0.000
	Pre-intermediate	2	37.5	37-38	0.500
L1 ENG ($n = 13$)	Beginner	4	20.00	18-22	2.000
	Elementary	5	25.60	24-28	1.496
	Pre-intermediate	4	34.5	33-35	0.866

Note: L1 Spanish = L1 Spanish - L2 Norwegian control group; L1 English = L1 English – L2 Norwegian control group; L1 Spanish – L2 English = L1 Spanish – L2 English – L3 Norwegian multilingual target group.

In addition to the Norwegian proficiency test, the multilingual Spanish target group also performed the Standardized Oxford Proficiency test of English, as detailed in section 5.2.4. The

test's range of score was 1-40 and provided assessment for learners of five different proficiency levels, from beginner (A1, score 1-8) to advanced (C1, score 33-40), in which levels were distributed in an equal interval of seven points each. The multilingual participants to take part in the present experiment scored in the range of 20-39 ($M = 33.72$), meaning no beginner nor elementary English level learners took part in the study. Based on their scores, L3 NOR participants were thus further divided according to their L2 ENG proficiency into three groups, namely pre-intermediate (B1, $n = 2$, score 20-22), intermediate (B2, $n = 3$, score 29-32), and advanced (C1, $n = 13$, score 34-39), as summarized in Table 16.

Table 16 - L3 Norwegian learners grouped by L2 English proficiency level.

	N	Mean	Range	SD
Pre-intermediate	2	21.00	20-22	1.000
Intermediate	3	30.33	29-32	1.247
Advanced	13	36.46	34-39	1.865

6.3 The grammaticality judgment task (GJT)

The overall results of the GJT are summarized in Table 17. As displayed in the table, the Norwegian native control group performed as expected, with participants reaching ceiling overall target-like scores (99.27%, $M = 63.53/64$) by correctly accepting grammatical items at a 100% rate and judging ill-formed sentences as ungrammatical in a 98.54% rate ($M = 31.53/32$), as shown in Table 17.

Table 17 - Mean scores of overall target-like performance by group.

Performance	L1 SPA – L2 ENG ($n = 18$)	L1 SPA ($n = 5$)	L1 ENG ($n = 13$)	L1 NOR ($n = 15$)
Target-like	50.33/64 (78.64%)	48.00/64 (75.00%)	49.07/64 (76.68%)	63.53/64 (99.27%)
Non-target like	13.67/64 (21.36%)	16.00/64 (25.00%)	14.13/64 (23.32%)	0.47/64 (0.73%)

Note: values shown for target properties only. Fillers were not included in the analysis.

The Norwegian learning groups, on the other hand, presented overall lower mean scores (Table 17), reaching very similar target-like mean scores (75% to 78.64%). As shown in Table 18, these groups have also scored similar overall target-like judgement in ungrammatical items

(74.37% to 75.24%), while showing a slight variation in their ratings of grammatical items (75.62% to 82.29%).

Table 18 - Mean scores of target-like performance by group and item type.

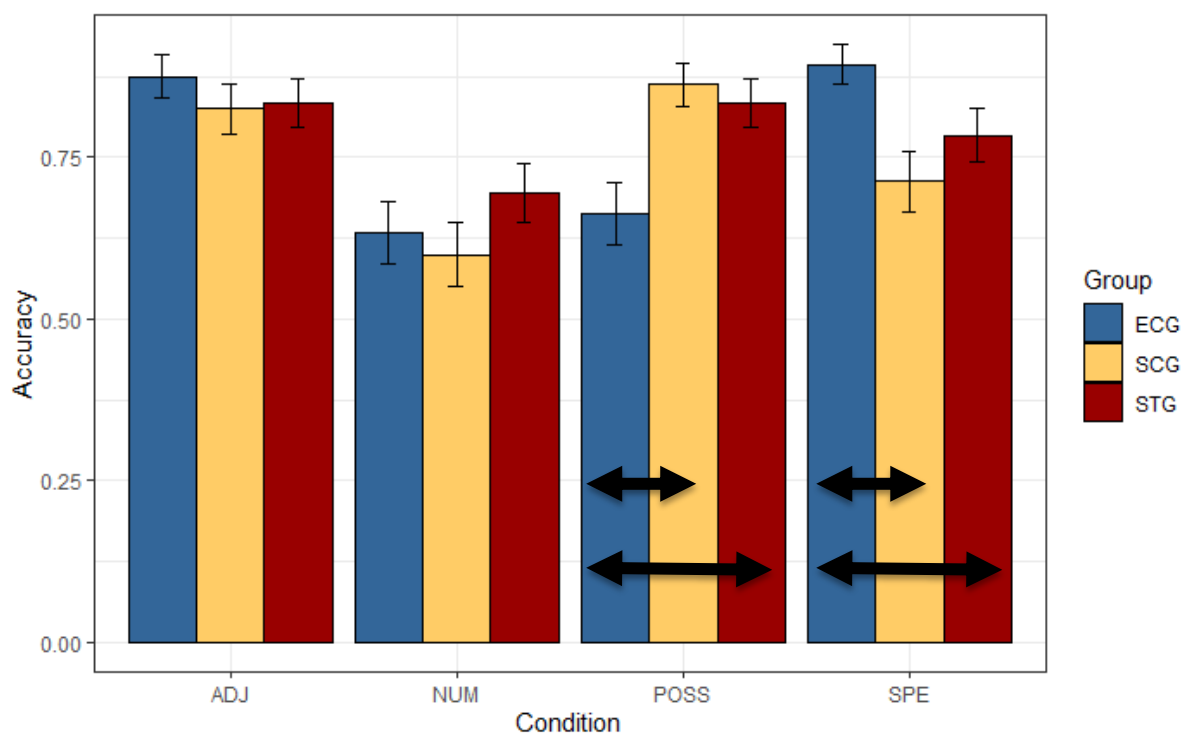
	L1 SPA – L2 ENG (<i>n</i> = 18)	L1 SPA (<i>n</i> = 5)	L1 ENG (<i>n</i> = 13)	L1 NOR (<i>n</i> = 15)
Grammatical	26.33/32	24.20/32	25.00/32	32/32
items	(82.29%)	(75.62%)	(78.12%)	(100%)
Ungrammatical	24.00/32	23.80/32	24.07/32	31.53/32
items	(75.00%)	(74.37%)	(75.24%)	(98.54%)

Note: values shown for target properties only. Fillers were not included in the analysis.

In order to statistically analyze the results obtained from the gathered data, a generalized linear mixed effects logistic regression model with accuracy predicted by an interaction between group and condition (the four linguistic properties tested) was employed. As previously presented (see section 5.2.2), ratings from both types of filler sentences were further removed from the analysis. Also in the logistic model, the Norwegian (A1 vs A2 vs B1) and English proficiency levels (B1 vs B2 vs C1) were added as separate fixed effects and random effects included by-item random intercepts and by-participant random slopes. In sum, the model revealed a strong significant effect of number ($p > .0001$) and possessives ($p > .0001$) conditions, as well as of Norwegian level B1 ($p > .0001$). Besides, two interactions were proven to be significant, namely the bilingual Spanish control group and possessives condition ($p > .0001$) and the multilingual Spanish target group and possessives agreement condition ($p > .0001$). The syntax and output of the generalized linear mixed effects logistic regression model are presented in Appendix 8A.

Post-hoc pairwise comparisons of groups within conditions revealed the bilingual English group was significantly less accurate than both the bilingual Spanish ($p > .05$) and multilingual Spanish ($p > .03$) groups in the treatment of nominal possessives gender agreement. On the other hand, the post-hoc test also pointed the bilingual English group performed significantly more accurate than their Spanish bilingual counterparts and the Spanish multilingual group in the treatment of subject pronoun expression items ($p > .03$ for both contrasts). Figure 3 illustrates participants' overall accuracy scores by condition. The output of the post-hoc pairwise comparisons of groups within conditions is presented in the Appendix 8B.

Figure 3 - Accuracy by linguistic group and condition.

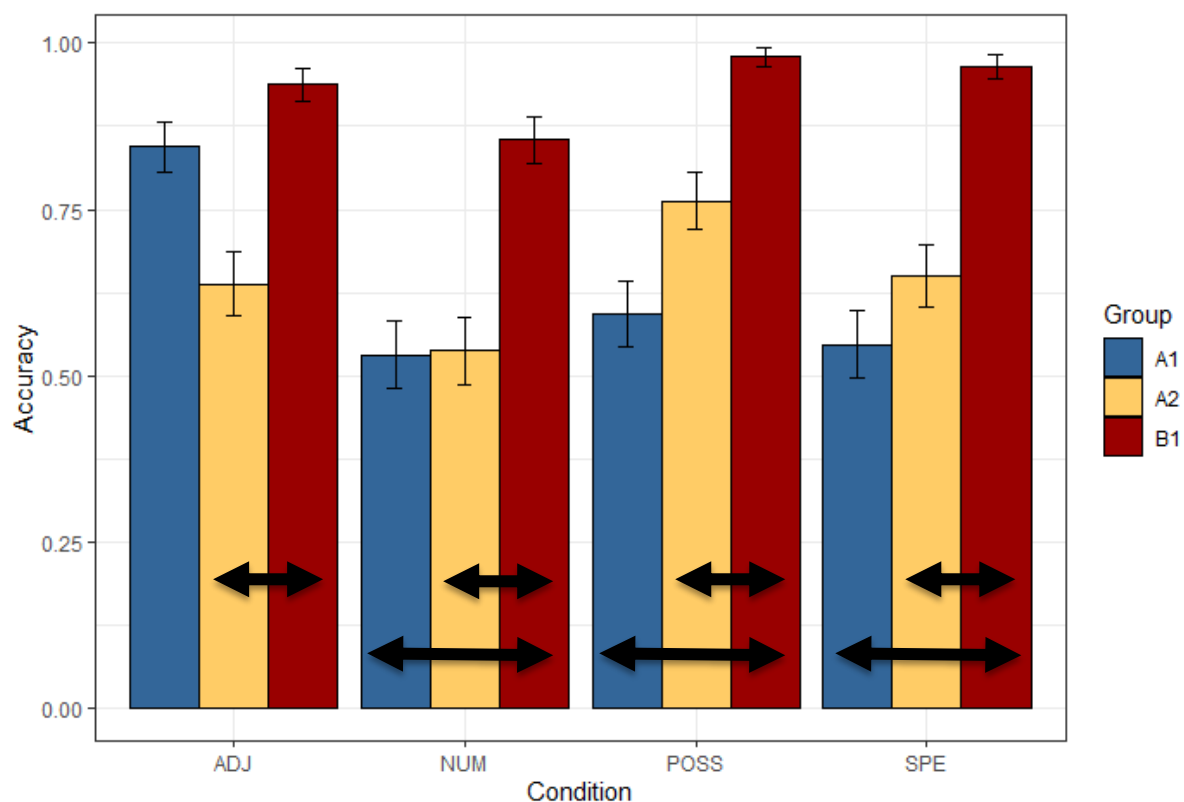


Note: ECG = English control group (L1 ENG – L2 NOR); SCG = Spanish control group (L1 SPA – L2 NOR); STG = Spanish target group (L1 SPA – L2 ENG – L3 NOR). Significant differences between groups are marked with arrows.

In regards to L3 proficiency levels in the multilingual target group, post-hoc pairwise comparisons of Norwegian level within conditions revealed beginner (A1) and elementary (A2) level participants performed statistically alike in all four linguistic properties tested. On the other hand, the post-hoc comparisons pointed both A1 and A2 level learners of L3 Norwegian performed significantly less accurately than their B1 counterparts in three of the tested properties, namely number concord ($p = .0018$ and $p = .0012$, respectively), possessives gender agreement ($p > .0001$ and $p = .0004$, respectively), and subject pronoun expression ($p > .0001$ for both contrasts), as illustrated in Figure 4. In addition, the comparisons showed A2 level participants also produced significantly less target-like rates than B1 learners in the treatment of adjective placement ($p > .01$).

As previously presented, the generalized linear mixed effects logistic regression model found no significant effect of L2 English level on participants' accuracy rates. The output of the post-hoc pairwise comparisons based on L3 Norwegian proficiency levels is presented in the Appendix 8C.

Figure 4 - Spanish target group accuracy by Norwegian proficiency and condition.



Note: significant differences between Norwegian proficiency levels are marked with arrows.

6.3.1 Results by property

The following subsections present in detail the results of the GJT by individual linguistic property. For the means of analysis, based on similar studies on L3A (e.g. Ben Abbas, 2016, 2020), the present thesis set the accuracy criterion rate of 75% for the acquisition of a given property.

6.3.1.1 Gender agreement on nominal possessives

The overall results of target-like performance on possessives gender agreement items is summarized in Table 19 below. As displayed in the table, the multilingual Spanish target group performed with similar target-like rates to the bilingual Spanish control group, while the bilingual English group was less accurate than both its L1 Spanish counterparts. This difference in performance, as previously presented, was proven to be significant ($p > .05$ for the bilingual Spanish and $p > .03$ for the multilingual Spanish group). Such statistical difference can be attributed to an effect of L1 Spanish over participants' ratings. As a [+gender] language, Spanish had a facilitative effect on Norwegian possessives gender agreement, whereas English,

a [-gender] language, did not. As also revealed in the analysis, English did not play a non-facilitative effect on the Spanish multilingual target group since, as previously presented, this group paired with the bilingual Spanish participants, while behaving significantly more accurate than the English controls. In addition, the generalized linear mixed effects logistic regression model (see Appendix 8A) and post hoc pairwise comparisons (see Appendix 8D) found no significant effects of L2 ENG proficiency level on the multilingual Spanish participants' ratings. These results, altogether, indicate the Spanish multilingual target group performance on L3 Norwegian possessives gender agreement items was solely influenced by L1 Spanish.

Following the established accuracy rate criterion for the acquisition of a given property at the rate of 75%, it is possible to conclude that, overall, both L1 Spanish groups had already acquired the possessives gender agreement property by the time of testing, while L1 English participants were still in developmental process of acquisition.

Table 19 - Possessives agreement target-like performance mean scores by group and item type.

	L1 SPA – L2 ENG (<i>n</i> = 18)	L1 SPA (<i>n</i> = 5)	L1 ENG (<i>n</i> = 13)	L1 NOR (<i>n</i> = 15)
Grammatical	7.11/8 (88.88%)	6.8/8 (85%)	5.53/8 (69.23%)	8/8 (100%)
Ungrammatical	6.22/8 (77.77%)	7/8 (87.5%)	5.07/8 (63.46%)	7.93/8 (99.16%)
Total	13.33 (83.33%)	13.8 (86.25%)	10.61 (66.34%)	15.93 (99.58%)

In a sentence type level, the Norwegian learning participants faced overall significantly ($p > .05$, see Appendix 8E) more challenges in rating ungrammatical sentences (73.95%, $M = 6.09/8$ target-like responses) as compared to grammatical ones (81.25%, $M = 6.48/8$ target-like responses). In an analysis by individual groups, the multilingual Spanish target group was able to identify ill-formed items in a 77.77% target-like rate ($M = 6.22/8$), while correctly accepting grammatical items in an 88.88% rate ($M = 7.11/8$), as shown in Table 18, a difference also proven to be significant ($p = .01$, see Appendix 8F). In terms of the bilingual control groups, the L1 Spanish participants were slightly more accurate in their judgments of ungrammatical (87.5%, $M = 7/8$) items as compared to grammatical ones (85%, $M = 6.8/8$), while the English bilingual counterparts reached a higher accuracy level in grammatical items (69.23%, $M = 5.53/8$) as compared to ungrammatical ones (63.46%, $M = 5.07/8$). Those differences, however, did not reach significant levels ($p > .05$) in neither of the bilingual groups (see Appendix 8F).

Gender: MASC vs NEUT

In the gender type level, the Spanish multilingual L3 Norwegian learners' target-like judgment was less accurate in ungrammatical items featuring neuter nouns (83.33%, $M = 3.33/4$) as compared to their grammatical counterparts (91.99%, $M = 3.66/4$) and significantly less accurate in ungrammatical items featuring masculine nouns (72.22%, $M = 2.88/4$) as compared to grammatical ones (86.11%, $M = 3.44/4$) ($p > .03$). As noticeable, the multilingual Spanish target participants obtained a higher target-like accuracy in rating structures featuring neuter nouns as compared to masculine ones, despite the Spanish language presenting only masculine and feminine genders. However, this difference did not reach significance ($p > .05$).

L3 proficiency

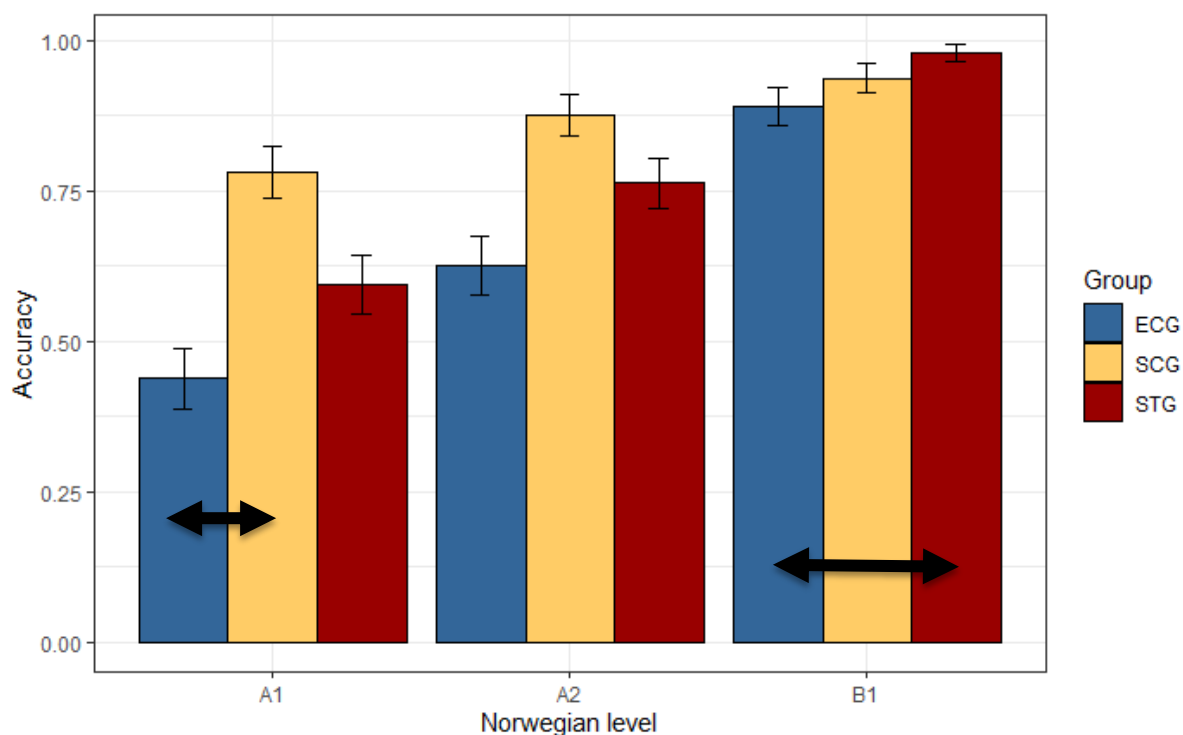
In terms of L3 Norwegian level effects within the multilingual Spanish group, results revealed a very strong effect of proficiency in accuracy ratings (see Appendix 8C), indicating an advantage for pre-intermediate learners over beginner and elementary level counterparts, as summarized in Table 20. As previously presented, beginner (A1) and elementary (A2) level L3 Norwegian learners performed statistically alike, while being significantly less sensitive to gender agreement violations as compared to pre-intermediate level participants ($p > .0001$ and $p = .0004$, respectively), as B1 participants achieved native-like performance (97,91%, $M = 15.66/16$).

Table 20 - Mean scores of target-like performance on possessives agreement by L3 Norwegian proficiency.

Performance	Beginner (A1) ($n = 4$)	Elementary (A2) ($n = 5$)	Pre-intermediate (B1) ($n = 9$)
Target-like	9.5 /16 (59.37%)	12.2/16 (76.25%)	15.66/16 (97.91%)
Non target-like	6.5/16 (40.63%)	3.8/16 (23.75%)	0.34/16 (2.09%)

In respect to Norwegian level effects over linguistic groups' accuracy, post-hoc pairwise comparisons revealed the following significant differences: in the beginner (A1) level, the English bilingual control group scored significantly lower than the bilingual Spanish group ($p > .05$), while in the pre-intermediate (B1) level, the multilingual Spanish target group was significantly more accurate than the English bilingual group ($p > .05$). These significant differences are illustrated in Figure 5.

Figure 5 - Possessives agreement accuracy by Norwegian level and linguistic group.



Note: Significant differences between linguistic groups are marked with arrows.

6.3.1.2 Determiner number concord

The general results of target-like performance on determiner number concord items are summarized in Table 21. As displayed in the table, this linguistic property was overall problematic to Norwegian learning participants, as all non-native groups presented a quite low accuracy level (< 70%) as compared to the other linguistic properties tested. In addition, post hoc pairwise comparisons found no significant differences between the Norwegian learning groups in terms of accuracy scores in their treatment of number concord items (see Appendix 8B). The low accuracy and lack of significant differences between groups could be partly attributed to the property’s difficulty level of acquisition since functional morphology, in general, is attested to pose more challenges to language learners as compared to other linguistic properties (Slabakova, 2016). In other words, individual morphosyntactic properties are not all equal in terms of complexity and learners’ developmental time (Ben Abbes, 2016). Besides, participants’ overall low accuracy scores in the number concord items could also be attributed to the property’s availability of input (Slabakova, 2016), as the Norwegian definite article realized as an independent word (e.g. *de*.PL ‘the’) is less commonly used as compared to its definite form expressed as a suffix on the noun (e.g. *elg-ene* ‘the moose’).

The combination of both factors, i.e. the property's difficulty level of acquisition and availability of input, may have influenced on participants overall failure in reaching the accuracy rate criterion of property acquisition (75%). In addition, the accuracy rating differences of grammatical and ungrammatical sentences were not significant neither on the overall level, i.e. all three Norwegian learning groups combined, nor within individual linguistic groups (see Appendices 8E & 8F), showing participants faced difficulties to correctly judge both natural and ill-formed sentences.

Table 21 - Number concord target-like performance mean scores by group.

	L1 SPA – L2 ENG (n = 18)	L1 SPA (n = 5)	L1 ENG (n = 13)	L1 NOR (n = 15)
Grammatical	5.88/8 (73.61%)	4.6/8 (57.5%)	4.92/8 (61.53%)	8/8 (100%)
Ungrammatical	5.22/8 (65.27%)	5.0/8 (62.5%)	5.23/8 (65.38%)	7.93/8 (99.16%)
Total	11.11 (69.44%)	9.6 (60%)	10.15 (63.46%)	15.93 (99.58%)

L3 proficiency

While the generalized linear mixed effects logistic regression model (see Appendix 8A) and post hoc pairwise comparisons (see Appendix 8D) failed to find any significant effects of L2 ENG proficiency, results revealed a strong effect of L3 Norwegian level within the multilingual Spanish group accuracy ratings (see Appendix 8C). Similarly to the possessives agreement property, results indicated a significant advantage for pre-intermediate (B1) learners over beginner (A1) and elementary (A2) level counterparts, as summarized in Table 22.

Table 22 - Mean scores of target-like performance on number concord items by L3 Norwegian proficiency.

Performance	Beginner (A1) (n = 4)	Elementary (A2) (n = 5)	Pre-intermediate (B1) (n = 9)
Target-like	8.5/16 (53.12%)	8.6/16 (53.75%)	13.66/16 (85.41%)
Non target-like	7.5/16 (46.88%)	7.4/16 (46.25%)	2.34/16 (14.59%)

On the one hand, no significant difference was found between beginner (A1) and elementary (A2) level L3 Norwegian learners performances, with the A1 group over-accepting ungrammatical items (40.62%, $M = 3.25/8$ target-like accuracy) and the A2 group performing slightly above chance in the ratings of ungrammatical sentences (55%, $M = 4.40/8$ target-like accuracy). On the other hand, pre-intermediate (B1) participants were significantly more

sensitive to determiner number concord violations, scoring higher than both A1 and A2 participants ($p = .0018$ and $p = .0012$, respectively). As displayed in Table 21, pre-intermediate (B1) participants were the only L3 sub-group to achieve the threshold of property acquisition (>75%). Despite the high target-like accuracy, the B1 group also failed to achieve native-like performance ($p > .05$). In regards to Norwegian level effects over linguistic groups' accuracy within the same proficiency, post-hoc pairwise comparisons found no significant effects.

6.3.1.3 Adjective placement

The overall results of target-like performance on adjective placement items is summarized in Table 23. As displayed in the table, all three Norwegian learning groups performed with high target-like rates (>80%). In addition, the overall performance of all three learning groups was statistically alike (see Appendix 8B). The combination of high accuracy achieved by the groups and the lack of significant differences between them suggest the Norwegian adjective placement property had, overall, already been acquired by the Norwegian learning participants at the point in which they were tested. In this respect, word order configurations are pointed to be, in general, more prominent in the language acquisition process, being frequently acquired at early stages (McDonald, 2000, 2006).

Table 23 - Adjective placement target-like performance mean scores by group.

	L1 SPA – L2 ENG ($n = 18$)	L1 SPA ($n = 5$)	L1 ENG ($n = 13$)	L1 NOR ($n = 15$)
Grammatical	6.94/8 (86.80%)	6.6/8 (82.5%)	7.38 (92.30%)	8/8 (100%)
Ungrammatical	6.39/8 (79.86%)	6.6/8 (82.5%)	6.61 (82.69%)	7.93/8 (99.16%)
Total	13.33 (83.33%)	13.20 (82.50%)	14 (87.50%)	15.93 (99.58%)

In a sentence type level, the Norwegian learning participants faced overall significantly ($p > .03$, see Appendix 8E) more challenges in rating ungrammatical sentences (81.25%, $M = 6.5/8$) as compared to grammatical ones (88.19%, $M = 7.5/8$). In an analysis by individual groups, the English control group was significantly more accurate ($p > .05$, see Appendix 8F) in the ratings of grammatical sentences (92.30%, $M = 7.38/8$) as compared to ungrammatical items (82.69%, $M = 6.61/8$). A similar trend was observed for the multilingual Spanish group, in which participants scored higher accuracy ratings in grammatical items (86.80%, $M = 6.94/8$) than in ungrammatical items (79.86%, $M = 6.39/8$). This difference, however, did not reach significance ($p > .05$). Finally, the bilingual Spanish control group performed alike in both grammatical and ungrammatical items.

Adjective: color vs nationality

In the adjective type level, the Spanish multilingual L3 Norwegian learners were significantly less accurate ($p > .03$) in their judgement of ungrammatical items (75%, $M = 3/4$) featuring color adjectives as compared to grammatical counterparts (88.88%, $M = 3.55/4$). On the other hand, participants scored the exactly same ratings in their treatment of grammatical and ungrammatical items featuring nationality adjectives (88.88%, $M = 3.55/4$). Following a paired samples t-test, the differences in accuracy ratings in structures featuring color and nationality adjectives did not reach significance ($p > .05$).

L3 proficiency

Table 24 summarizes the mean scores on adjective placement by L3 Norwegian proficiency level. As displayed in the table, beginner (A1) and pre-intermediate (B1) level participants had both acquired the Norwegian adjective placement by the time of testing (>75%), while the elementary (A2) sub-group surprisingly scored below the set criterion rate for the acquisition of this property (<75%). In terms of L3 Norwegian level effects, results pointed elementary (A2) level participants were strongly less sensitive to adjective placement violations as compared to B1 learners ($p = .01$). Despite the overall high scores, none of the L3 Norwegian proficiency sub-groups achieved native-like performance ($p > .05$).

Table 24 - Mean scores of target-like performance on adjective placement items by L3 Norwegian proficiency.

Performance	Beginner (A1) ($n = 4$)	Elementary (A2) ($n = 5$)	Pre-intermediate (B1) ($n = 9$)
Target-like	13.5/16 (84.37%)	10.2/16 (63.75%)	15/16 (93.75%)
Non target-like	2.5/16 (15.63%)	5.8/16 (36.25%)	1/16 (6.25%)

Finally, in respect to Norwegian level effects over linguistic groups' accuracy within the same proficiency, post-hoc pairwise comparisons revealed one single significant effect, in which the A2 level multilingual Spanish group performed less accurately than A2 English bilingual counterparts ($p > .01$).

6.3.1.4 Subject pronoun expression

The overall results of target-like performance on subject pronoun expression items is summarized in Table 25. As displayed in the table, both L1 Spanish groups obtained similar

mean score performances in their treatment of the Norwegian subject pronoun expression, while behaving less accurately as compared to their L1 English bilingual counterparts. This difference in performance, as previously presented, was proven to be significant ($p > .03$ for both contrasts, see Appendix 8B). Such statistical differences point to an overall facilitative effect of L1 English and a non-facilitative effect of L1 Spanish over participants' SPE ratings. As previously detailed in section 3.4, English, similarly to Norwegian, is a [-pro-drop] language, while Spanish is set as a [+pro-drop] language. Following the statistical results aforementioned, it is noteworthy that, despite the Spanish multilingual participants having English as their L2, this language did not play a facilitative effect on the group's treatment of Norwegian SPE. Conversely, results have revealed the multilingual group's L1 Spanish posed a non-facilitative effect over participants' ratings. These results, altogether, indicate the Spanish multilingual target group performance on L3 Norwegian SPE items was solely influenced by their L1 Spanish.

Table 25 - Subject pronoun expression target-like performance mean scores by group.

	L1 SPA–L2 ENG ($n = 18$)	L1 SPA ($n = 5$)	L1 ENG ($n = 13$)	L1 NOR ($n = 15$)
Grammatical	6.38/8 (79.86%)	6.2/8 (77.5%)	7.15 (89.42%)	8/8 (100%)
Ungrammatical	6.16/8 (77.08%)	5.2/8 (65%)	7.15 (89.42%)	7.73/8 (96.66%)
Total	12.55 (78.47%)	11.4 (71.25%)	14.3 (89.42%)	15.73 (98.33%)

In the sentence type level, the Norwegian learning participants' accuracy rating differences of grammatical and ungrammatical sentences was not significant neither on an overall level, i.e. all three Norwegian learning groups combined, nor in an analysis by individual linguistic groups (see Appendices 8E & 8F).

SPE: embedded vs expletive clauses

In the SPE clause type level, the Spanish multilingual L3 Norwegian learners performed significantly ($p > .01$) less accurate in ungrammatical items (75%, $M = 3/4$) featuring expletive clauses as compared to their grammatical counterparts (90.27%, $M = 3.61/4$). Conversely, the grammatical items featuring embedded clauses were found to be more problematic (69.44%, $M = 2.77/4$) to multilingual Spanish participants as compared to ungrammatical sentences (79.16%, $M = 3.16/4$). This difference, nevertheless, failed to achieve significance. Following

a paired samples t-test, the differences in accuracy ratings in structures featuring embedded and expletive clauses also did not reach significance ($p > .05$).

L3 proficiency

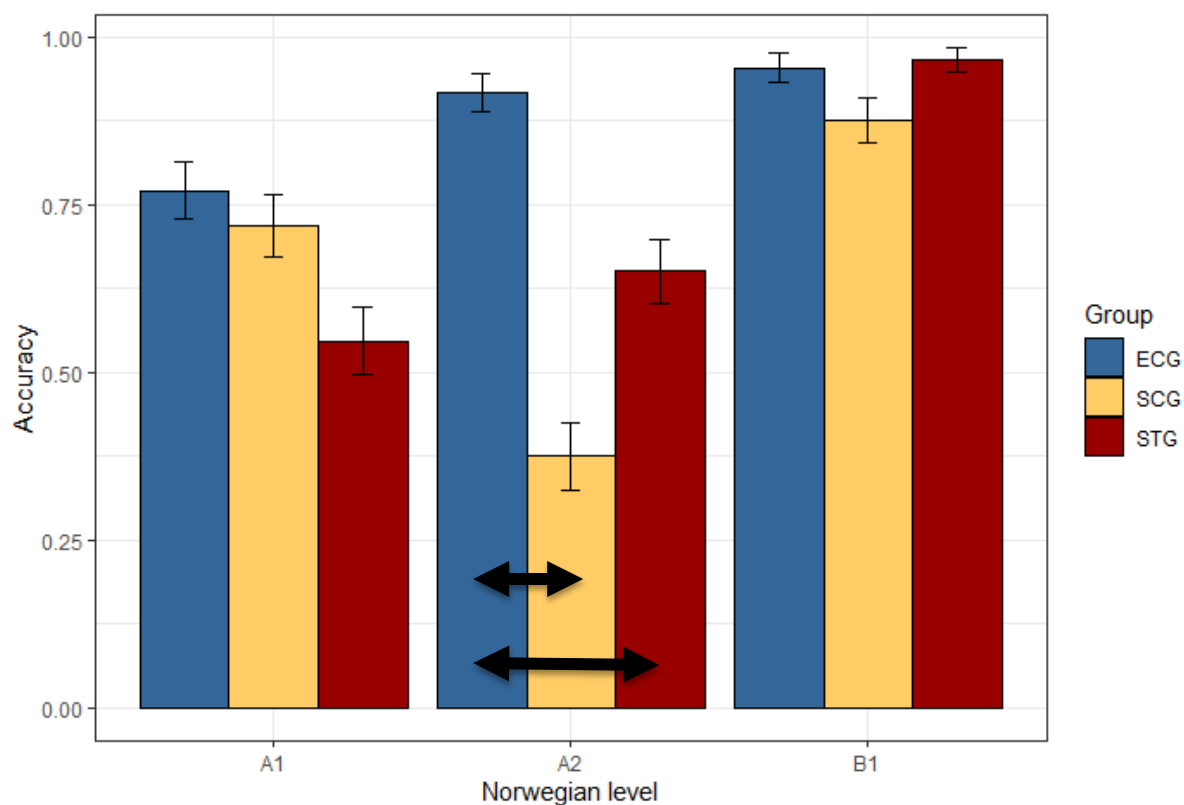
In regards to L3 Norwegian proficiency effects over accuracy levels within the multilingual Spanish target group, post hoc pairwise comparisons (see Appendix 8C) revealed a strong difference between both beginner (A1) and elementary (A2) level learners' performances as compared to pre-intermediate (B1) L3 Norwegian learners ($p > .0001$ for both contrasts). This difference in performance clearly indicates an advantage for intermediate proficiency learners, who achieved overall native-like performance (96.52%, $M = 15.44/16$), over basic level ones in the treatment of the Norwegian subject pronoun expression property, as shown in Table 26. As also displayed in the table, pre-intermediate (B1) participants were the only L3 sub-group to achieve the threshold of property acquisition ($>75\%$).

Table 26 - Mean scores of target-like performance on SPE items by L3 Norwegian proficiency.

Performance	Beginner (A1) ($n = 4$)	Elementary (A2) ($n = 5$)	Pre-intermediate (B1) ($n = 9$)
Target-like	8.75/16 (54.68%)	10.4/16 (65%)	15.44/16 (96.52%)
Non target-like	7.25/16 (45.32%)	5.6/16 (35%)	0.56/16 (3.48%)

Finally, in respect to Norwegian level effects over linguistic groups' accuracy, post-hoc pairwise comparisons revealed the English bilingual A2 group performed with a higher accuracy rate than both L1 Spanish groups of the same proficiency ($p > .01$ for both contrasts). These significant differences are illustrated in Figure 6.

Figure 6 - Subject pronoun expression accuracy by Norwegian level and linguistic group.



Note: Significant differences between linguistic groups are marked with arrows.

Summary of the GJT results

In sum, the multilingual Spanish target group patterned with the bilingual Spanish control group in two of the conditions, namely possessives agreement and subject pronoun expression, in which both L1 Spanish groups performed significantly different from the bilingual English controls. In the one hand, both L1 Spanish groups outperformed their L1 English counterparts ($p > .05$ for the bilingual Spanish and $p > .03$ for the multilingual Spanish group) in the treatment of Norwegian possessives gender agreement. On the other hand, both L1 Spanish groups performed less accurately than the L1 English control group ($p > .03$ for both contrasts) in their judgment of SPE sentences. On the two remaining conditions, namely number concord and adjective placement, participants from all Norwegian learning groups performed alike. The number concord property proved to be an overall problematic condition, as none of the learning groups achieved the accuracy criterion rate of 75% for the acquisition of this property, while the adjective placement condition was unproblematic for all groups (above 80% accuracy).

Within the multilingual Spanish group, the L3 Norwegian proficiency level was proven to have a strong effect on participants' accuracy. On three of the tested conditions (possessives

agreement, number concord, and SPE), A1 and A2 level learners behaved alike, while being significantly less accurate than their B1 counterparts. On the adjective placement property, elementary (A2) level participants were less sensitive to violations as compared to B1 learners ($p = .01$). Finally, participants' proficiency level in English had no significant effects on their performance.

6.4 The closed-ended questionnaire

As early presented (see section 5.2.3), the closed-ended questionnaire, adapted from Ben Abbes (2016, 2020), was developed to investigate participants' perception on (i) the linguistic relatedness between their L1, L2, and L3, and (ii) the difficulty level of acquisition of each of the four linguistic properties tested. The task's proposal was to further investigate the topic of CLI in L3A from a perceived linguistic proximity perspective. Specially, the questionnaire aimed to provide further insights on whether the CLI was holistic or property-by-property realized and to investigate the perceived difficulty level of individual properties as a potential influencing variable triggering CLI in the L3A.

In order to investigate the psycholinguistic proximity role of the L1 and L2 in the L3A, L3 Norwegian learners were asked to rate the relatedness levels between their background languages and their L3 based on two main perspectives. Firstly, L3 learners were asked to compare how similar or different they perceived their L1, L2, and L3 to be on a holistic basis, i.e. the relatedness level across languages in general. Secondly, participants were invited to analyze the (dis)similarities across languages on a structural level, i.e. on a property-by-property basis, by rating how similar or different they perceived the four L3 Norwegian properties tested to be in comparison to their L1 Spanish and L2 English. In addition, participants were requested to rate how difficult they perceived the four target properties to be in regards to their learning process.

6.4.1 Psychotypological proximity

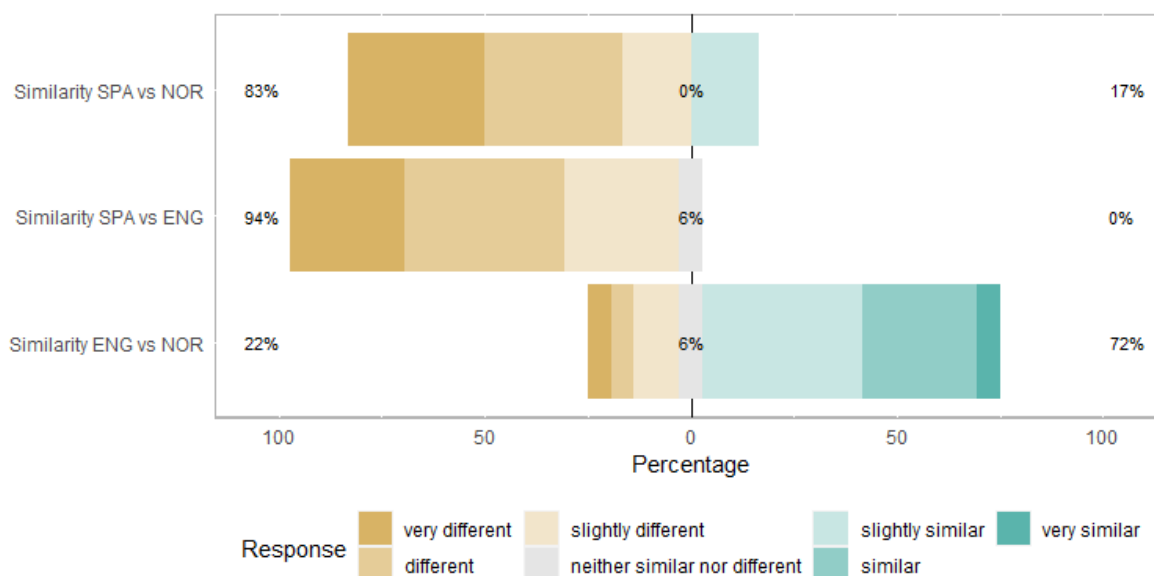
In respect to the holistic relatedness items, i.e. the psychotypological proximity, the Spanish multilingual participants were asked to rate three main questions featuring general cross-linguistic comparisons, i.e. the pairs L1 vs L3, L2 vs L3, and finally L1 vs L2 (see Appendix 3 for details). An item example is provided in (47) below:

(47) How similar do you think the English and the Norwegian languages are?

Very different _____ Very similar

The findings of psychotypological proximity questions were as follows. In regards to the (dis)similarity between Spanish (L1) and Norwegian (L3), most of participants rated the two languages as being *very different* ($n=6$, 33.33%), *different* ($n=6$, 33.33%) or *slightly different* ($n=3$, 16.66%), while a minority of them ($n=3$, 16.66%) rated the languages as slightly similar. None of the participants rated the language pair as *similar* or *very similar*. In terms of English (L2) and Norwegian (L3) general relatedness level, on the contrary, the majority of participants expressed they perceived the language pair to be *slightly similar* ($n=7$, 38.88%), *similar* ($n=5$, 27.77%) or *very similar* ($n=1$, 5.55%), whereas a few participants rated them as *very different*, *different*, *neutral* ($n=1$, 6.0% for each level) or *slightly different* ($n=2$, 11.11%). Finally, in respect to Spanish (L1) and English (L2), participants rated the language pair as *very different* ($n=5$, 27.77%), *different* ($n=7$, 38.88%) or *slightly different* ($n=5$, 27.77%), with only one learner rating them as *neutral* ($n=1$, 5.55%). Participants' responses are illustrated in Figure 7 for better visualization.

Figure 7 – Participants' responses on psychotypological proximity.



In sum, these results point that, overall, the psychotypological proximity of the languages in study was in accordance with the factual typological proximity of the language pairs in all 3 comparisons. Participants pointed to be aware that English and Norwegian are two

typologically similar languages (Germanic languages), while Spanish (Romance language) is typologically different from both English and Norwegian.

Based on the psychotypological proximity of languages, participants were further asked to rate whether they believed having a previous knowledge of (i) Spanish and (ii) English was helpful in the learning process of L3 Norwegian. The two questions proposed were as follows (48).

(48) (i) Do you think knowing Spanish helps you learning Norwegian?

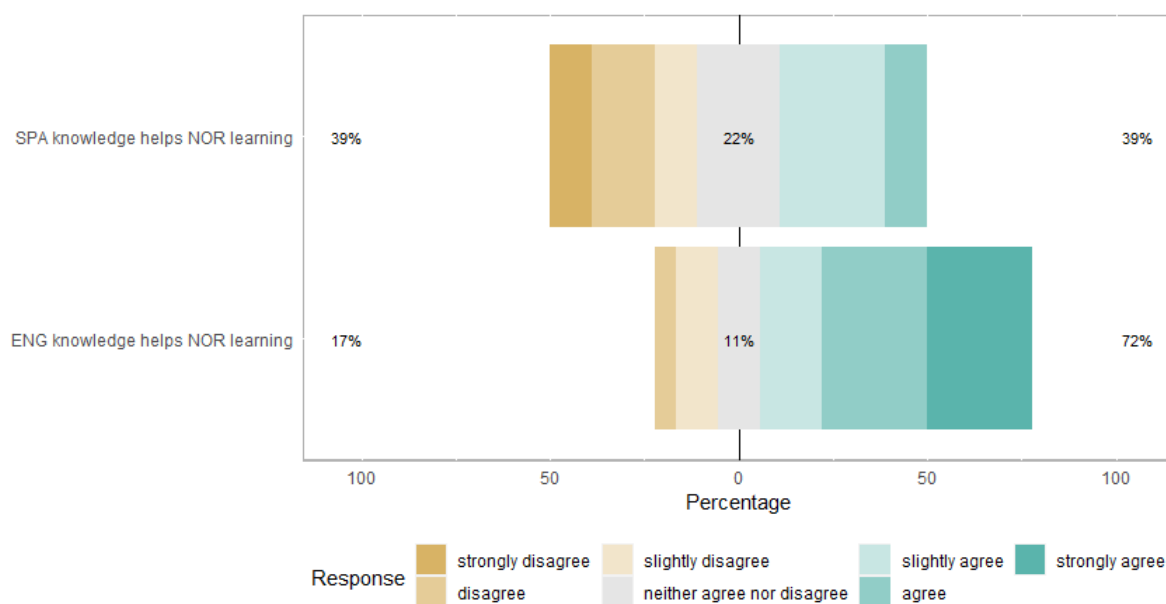
Strongly disagree _____ Strongly agree

(ii) Do you think knowing English helps you learning Norwegian?

Strongly disagree _____ Strongly agree

Results showed participants believed having a previous knowledge of English (L2) was overall helpful in the learning process of L3 Norwegian, whereas no consensus was achieved in regards to the facilitative role of Spanish (L1). Specifically, the majority of participants stated to *slightly agree* ($n=3$, 16.66%), *agree* ($n=5$, 27.77%) or *strongly agree* ($n=5$, 27.77%) on whether English was helpful in terms of Norwegian acquisition, while one participant *disagreed* (5.55%), two *slightly disagreed* (11.11%) and two remained *neutral* (11.11%). This result could be associated to the fact participants were able to correctly perceive English as a typological similar language to Norwegian, i.e. on a holistic basis. As for Spanish, results were distributed as follows: four participants gave a neutral rate (22.22%), while seven of them expressed, to different degrees, to disagree [*strongly disagree* ($n=2$, 11.11%), *disagree* ($n=3$, 16.66%), *slightly disagree* ($n=2$, 11.11%)] and seven, also to different degrees, to agree [*slightly agree* ($n=5$, 27.77%), *agree* ($n=2$, 11.11%)]. As previously stated, these latter results show participants were unable to find an agreement on whether their L1 Spanish was helpful or not in relation to the L3 Norwegian learning process. Participants' responses are illustrated in Figure 8 for better visualization.

Figure 8 - Participants' responses on background languages' role in L3 Norwegian learning.



Finally, participants were asked to rate the difficulty level in regards to the Norwegian language acquisition in general. Results showed the majority of participants rated the acquisition process as *very difficult* ($n=1$, 5.55%), *difficult* ($n=7$, 38.88%), or *slightly difficult* ($n=7$, 38.88%), while only three participants expressed it to be *neither easy nor difficult* (16.66%).

6.4.2 Structural proximity

The structural proximity, i.e. property-by-property basis, questions proposed in the closed-ended questionnaire were of twofold nature, namely regarding each property relatedness between participants' background languages and their L3 Norwegian, and regarding individual property's perceived learning difficulty level (see Appendix 3 for details). An example of each question type is respectively given in (49) and (50) below.

(49) How similar/different is the Norwegian adjective placement to the one in Spanish?

Very different _____ Very similar

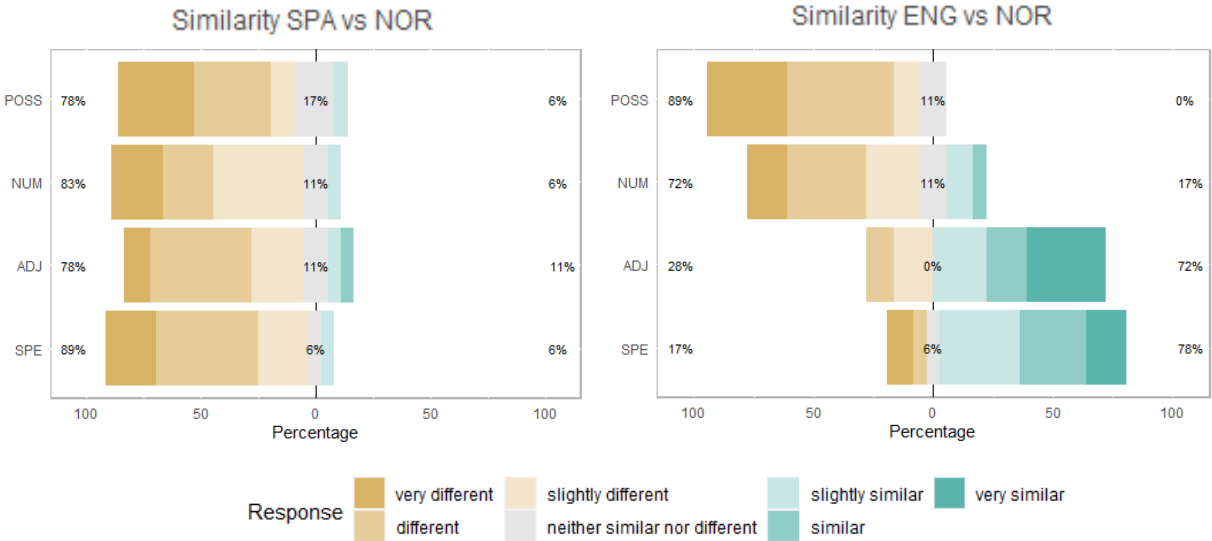
(50) How difficult is it for you to learn the Norwegian adjective placement (ex. whether it is 'en *norsk* butikk' or 'en butikk *norsk*')?

Very difficult _____ Very easy

In terms of the structural proximity between the background languages and L3 Norwegian, results showed participants have perceived all four Norwegian morphosyntactic properties to be different from their counterparts in Spanish, suggesting learners perceived the linguistic proximity of the language pair in a holistic basis rather than in a property-by-property basis. In this context, the overall ratings for all tested properties were placed within the *different* spectrum scale (>75%), indicating participants overgeneralized the Spanish language as ‘different’ from Norwegian, therefore failing to recognize the individual properties in which both languages’ systems are actually similar (e.g. possessives gender agreement and determiner number concord).

On the other hand, results for the structural proximity between L2 English and L3 Norwegian showed participants were aware of the language pair (dis)similarities based on each individual morphosyntactic property tested. In this context, learners successfully perceived the Norwegian possessives gender agreement and determiner number concord properties as presenting different features from their counterparts in English, with overall responses being placed within the *different* spectrum scale (>70%). Conversely, for the adjective placement and subject pronoun expression properties, overall results were distributed within the *similar* spectrum scale (>70%), showing participants successfully perceived these Norwegian properties to display similar structures to the ones found in English. These results point participants’ were able to perceive the linguistic proximity of English and Norwegian in a property-by-property (structural) basis. Participants’ overall responses regarding the linguistic proximity by morphosyntactic property are summarized in Figure 9.

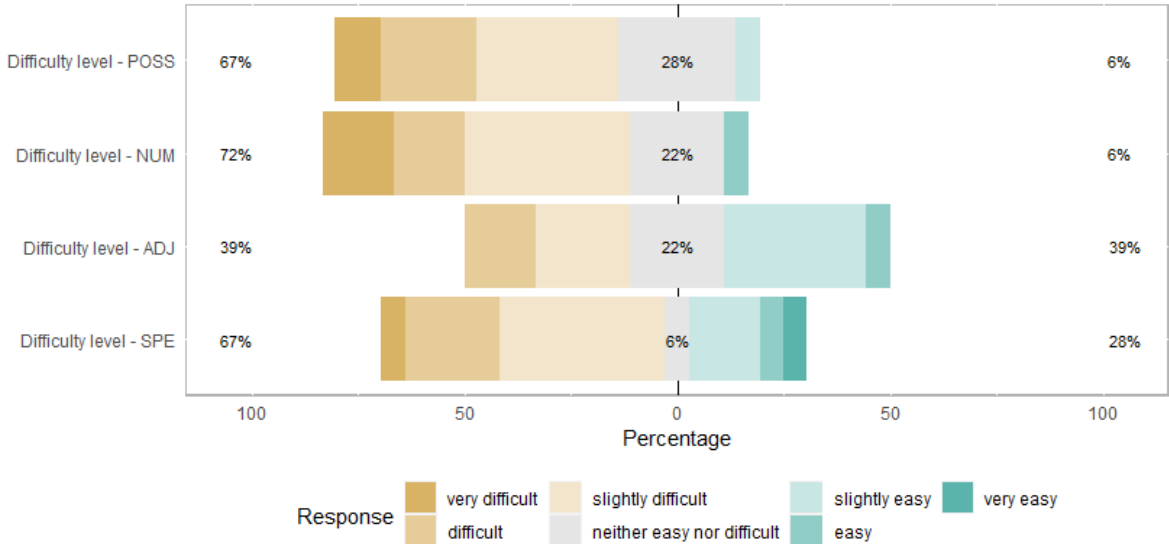
Figure 9 – Comparison of participants' responses on L3 similarity sorted by language pair and property.



Altogether, the differences in the linguistic proximity basis found in the language pairs could be attributed to the metalinguistic knowledge of participants. In this scenario, L3 Norwegian learners were more accurate in pin-pointing the (dis)similarities between their L3 and L2 (English) in a property-by-property basis as compared to the (dis)similarities between their L3 and L1 (Spanish), in which the language proximity was only holistically perceived. This could be associated with the fact that the L2 learning experience shares more similarities with the L3 acquisition as compared to the naturalistic acquisition of the L1, such as the degree of metalinguistic awareness of syntactic features, age of onset, and learning environment (Bardel & Falk, 2007; Falk & Bardel, 2011).

In respect to the perceived learning difficulty level by individual property, the closed-ended questionnaire results showed participants considered three of the tested Norwegian morphosyntactic properties as ‘difficult’ features in regards to their learning process, namely the possessives gender agreement, determiner number concord, and SPE. Responses regarding the difficulty level of the Norwegian adjective placement showed overall no agreement, as ratings were equally distributed in the ‘difficult’ ($n=7$, 39%) and ‘easy’ ($n=7$, 39%) spectra, in addition to four participants neutral ratings (22%). The overall responses regarding the perceived difficulty level of acquisition by individual property are summarized in Figure 10.

Figure 10 - Participants' responses on difficulty level sorted by linguistic property.



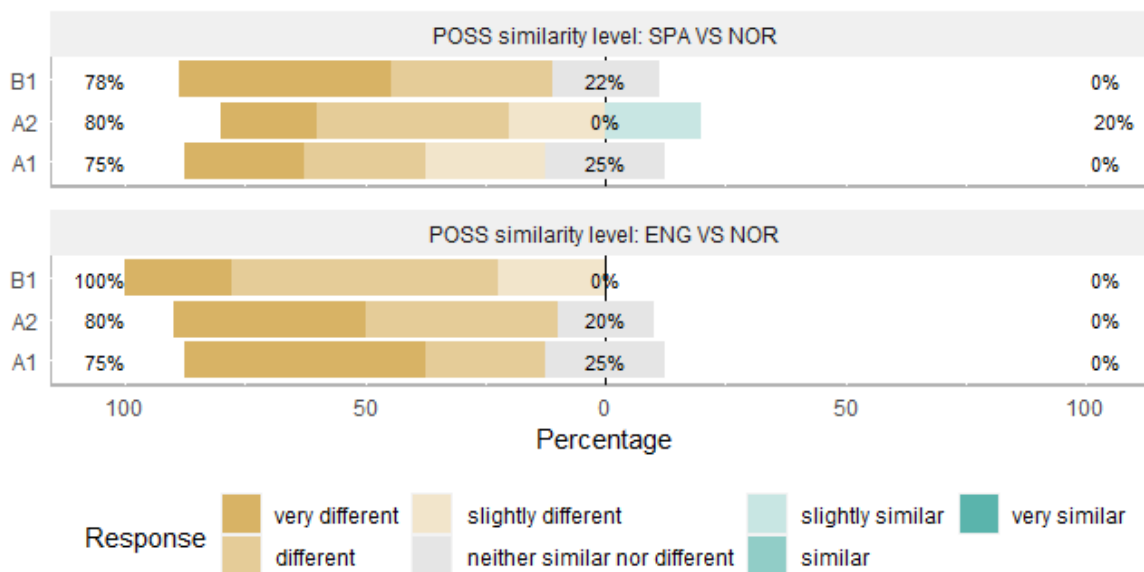
The following sub-sections detail the results obtained by linguistic property.

6.4.2.1 Gender agreement on nominal possessives

In respect to the Norwegian nominal possessives gender agreement relatedness to participants' background languages, results showed the L3 learners perceived this property to be overall *very different* ($n=6$, 33.33%), *different* ($n=6$, 33.33%) or *slightly different* ($n=2$, 11.11%) from the one in Spanish. Only one participant rated this Norwegian property as *slightly similar* ($n=1$, 5.55%) to the one in their native language, while three participants perceived this property to be *neither similar nor different* (16.66%). On the other hand, participants were able to correctly identify the possessives gender agreement property in Norwegian as *very different* ($n=6$, 33.33%), *different* ($n=8$, 44.44%) or *slightly different* ($n=2$, 11.11%) from the one in English, as the latter is considered a [-gender] language. Two participants (11.11%) rated this property as *neither similar nor different* from English, but none of the learners rated it as *slightly similar*, *similar* or *very similar*, which suggests participants were aware of the unrelatedness of Norwegian and English in regards to gender agreement.

Despite participants failing to perceive the relatedness of Norwegian and Spanish in regards to this property, the GJT results on possessives gender agreement (section 6.2.1.1) indicated the multilingual L3 NOR learners' performance was solely influenced by their L1 Spanish (facilitative CLI). These results suggest the perceived structural proximity between Norwegian and Spanish possessives gender agreement had no significant influence on participants' overall performance. In an analysis sorted by Norwegian proficiency levels, participants from beginner (A1), elementary (A2), and pre-intermediate (B1) levels all failed to perceive the relatedness of possessives gender agreement between Norwegian and Spanish, with most of the ratings being placed within the 'different' spectrum scale (>75%), as shown in Figure 11. Specifically, responses for each proficiency sub-group were as follows: A1 learners ratings were equally distributed within four types ($n=1$, 20% for each rating), namely *very different*, *slightly different*, *different*, and *neither similar nor different*. In a similar vein, A2 learners' ratings were also distributed within four response types: *very different* ($n=1$, 20%), *different* ($n=2$, 40%), *slightly different* ($n=1$, 20%), and *slightly similar* ($n=1$, 20%), while four B1 participants perceived both languages to be *very different* (44.44%), three as *different* (33.33%) and two as *neither similar nor different* (22.22%).

Figure 11 - Comparison of participants' responses on possessives gender agreement similarity sorted by linguistic pair and Norwegian proficiency level.



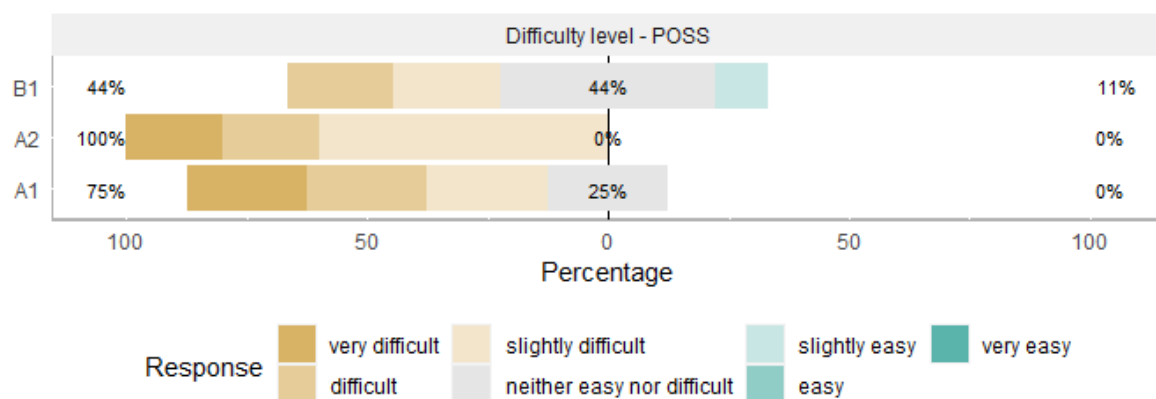
Conversely, all proficiency sub-groups were able to perceive the Norwegian possessives property as different from the one in English, with most of ratings also ranging within the ‘different’ spectrum scale (>75%). In this context, A1 and A2 level learners presented a very similar rating distribution: for the A1 sub-group, responses were placed as *very different* ($n=2$, 50%), *different* ($n=1$, 25%), and *neutral* ($n=1$, 25%). In a similar manner, two A2 learners rated the languages as *very different* (40%), two as *different* (40%), and one as *neutral* (20%). As for the B1 sub-group, responses were solely distributed within the ‘different’ spectrum - *very different* ($n=2$, 22.22%), *different* ($n=5$, 55.55%), and *slightly different* ($n=2$, 22.22%) - which suggests B1 participants were fully aware of the unrelatedness of Norwegian and English in regards to possessives gender agreement.

Finally, participants rated the Norwegian possessives gender agreement as an overall difficult property to learn. Specifically, participants ratings were mostly placed between the range of *very difficult* ($n=2$, 11.11%), *difficult* ($n=4$, 22.22%) or *slightly difficult* ($n=6$, 33.33%). Five participants rated the property as *neither easy nor difficult* ($n=5$, 27.77%) and one as *slightly easy* (5.55%). None of the participants perceived the property to be *easy* or *very easy* in terms of learning. Despite that, the mean score of participants on possessives items in the GJT was of 83.33% (see section 6.2.1.1 for details), indicating this property, overall, was not problematic for the Spanish multilingual participants. In a L3 Norwegian proficiency level, similar results were found for A1 participants, whose ratings were equally distributed between

very difficult, *difficult*, *slightly difficult*, and *neither easy nor difficult* (n=1, 25% each). As for A2 level participants, all responses were rated within the ‘difficult’ spectrum scale, being distributed in *very difficult* (n=1, 20%), *difficult* (n=1, 20%), and *slightly difficult* (n=3, 60%). B1 level participants, on the other hand, found no consensus in regards to the property’s difficulty level, being mainly perceived between the *difficult* and *neither easy nor difficult* spectra. The ratings for this sub-group were as follows: two participants rated the property as *slightly difficult* (22.22%), while two of them as *difficult* (22.22%), four as *neither easy nor difficult* (44.44%), and one as *slightly easy* (11.12%).

As noticeable from Figure 12 below, despite the fact all sub-groups perceived the Norwegian possessives gender agreement as a challenging property, B1 learners have consider it far less problematic (44%) as compared to A1 (75%) and A2 (100%) proficiency participants. One possible justification for this difference lies in the fact that learners at more advanced developmental stages (e.g. B1 level) are likely to have accumulated more substantial knowledge of the target language as compared to learners at earlier stages (e.g. A1 and A2 levels), leading the first to perceive the learning difficulty level of certain properties as less challenging as compared to latter.

Figure 12 - Participants' responses on possessives gender agreement difficulty level sorted by Norwegian proficiency level.



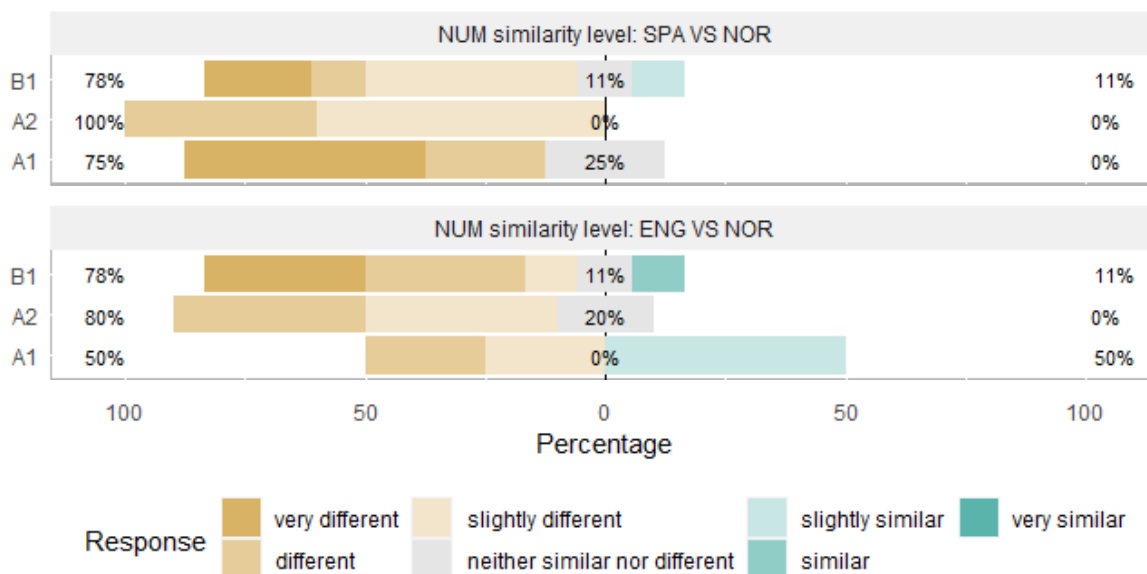
6.4.2.2 Determiner number concord

Results of the determiner number concord questions displayed similar results to the ones found in the possessives agreement items. Overall, participants have perceived the Norwegian number concord property to be mainly *very different* (n=4, 22.22%), *different* (n=4, 22.22%) or *slightly different* (n=7, 38.88%) from the one in Spanish, while one single participant rated this Norwegian property as *slightly similar* (n=1, 5.55%) and two participants as *neither similar*

nor different (11.11%). Distinctly, the majority of participants have correctly perceived English and Norwegian to present a different configuration in terms of determiner number concord, as most of participants expressed both languages to be *very different* ($n=3$, 16.66%), *different* ($n=6$, 33.33%) or *slightly different* ($n=4$, 22.22%) in regards to this property. Two participants perceived the language pair to be *neither similar nor different* (11.11%), whereas one learner rated them as *similar* (5.55%), and two as *slightly similar* (11.11%).

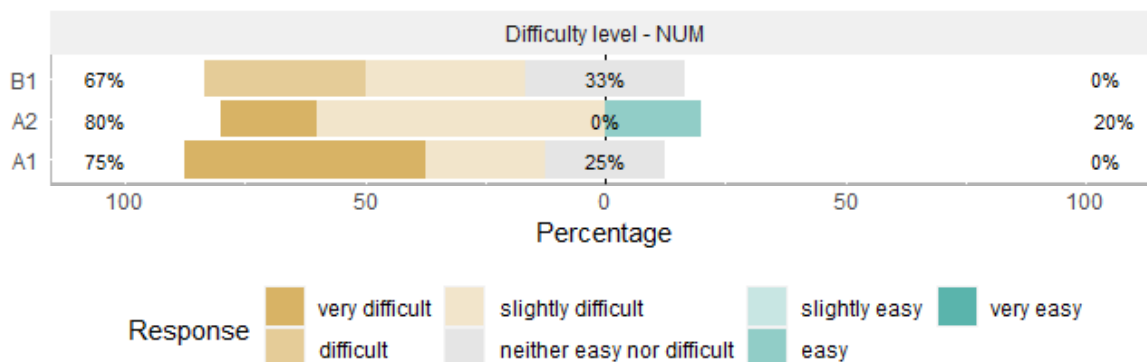
In an analysis sorted by Norwegian proficiency levels, participants from all three levels, i.e. A1, A2, and B1, have overall perceived the Spanish determiner number concord to be different from the one presented in Norwegian. The responses were as follows: in the beginner (A1) sub-group, participants classified the language pair as *very different* ($n=2$, 50%), *different* ($n=1$, 25%) or *neither similar nor different* ($n=1$, 25%), while elementary (A2) learners perceived the pair as either *different* ($n=2$, 40%) or *slightly different* ($n=3$, 60%). Finally, the pre-intermediate (B1) participants rated the languages' similarity level as *very different* ($n=2$, 22.22%), *different* ($n=1$, 11.11%), *slightly different* ($n=4$, 44.44%), *neither similar nor different* ($n=1$, 11.11%), and *slightly similar* ($n=1$, 11.11%). In regards to the Norwegian and English number concord relatedness, results pointed A1 participants found no consensus over their L2 English (dis)similarity to Norwegian, as responses were distributed as *different* ($n=1$, 25%), *slightly different* ($n=1$, 25%), and *slightly similar* ($n=2$, 50%). On the other hand, both A2 and B1 sub-groups have correctly perceived this Norwegian property to be different from English, with A2 responses ranging from *different* ($n=2$, 40%), *slightly different* ($n=2$, 40%), and *neither similar nor different* ($n=1$, 20%), and B1 as *very different* ($n=3$, 33.33%), *different* ($n=3$, 33.33%), *slightly different* ($n=1$, 11.11%), *neutral* ($n=1$, 11.11%), and *similar* ($n=1$, 11.11%). The overall responses regarding the perceived similarity of the Norwegian number concord sorted by proficiency sub-groups are summarized in Figure 13.

Figure 13 - Comparison of participants' responses on number concord similarity sorted by linguistic pair and Norwegian proficiency level.



Finally, in regards to the Norwegian number concord property difficulty level, participants have mainly considered it as *very difficult* ($n=3$, 16.66%), *difficult* ($n=3$, 16.66%), or *slightly difficult* ($n=7$, 38.88%), with four learners rating it as *neither easy nor difficult* (22.22%) and one as *easy* (5.55%). In an analysis sorted by Norwegian level, all three proficiency sub-groups overall ratings indicated participants perceived the Norwegian determiner number concord as difficult, within different degrees. In the A1 level, responses ranged from *very difficult* ($n=2$, 50%) to *neither easy nor difficult* ($n=1$, 25%), with one participant rating it as *slightly difficult* (25%). In the A2 level, responses ranged from *very difficult* ($n=1$, 20%) to *easy* ($n=1$, 20%), with three participants rating it as *slightly difficult* (60%). Finally, as for the B1 sub-group, responses were equally distributed within three types of ratings ($n=3$, 33.33% each): *difficult*, *slightly difficult*, and *neither easy nor difficult*. As noticeable from Figure 14, despite the fact all sub-groups perceived the Norwegian number concord as a challenging property, B1 learners seem to have consider it slightly less problematic (67%) as compared A1 (75%) and A2 (80%) proficiency participants. As shown in the figure, while A1 and A2 participants' have rated this property as mainly *very difficult* (50%) and *slightly difficult* (60%), respectively, B1 learners' responses were equally distributed within *difficult*, *slightly difficult*, and *neither easy nor difficult* (33.33% each), with no participant having rated it as *very difficult*.

Figure 14 - Participants' responses on number concord difficulty level sorted by Norwegian proficiency level.



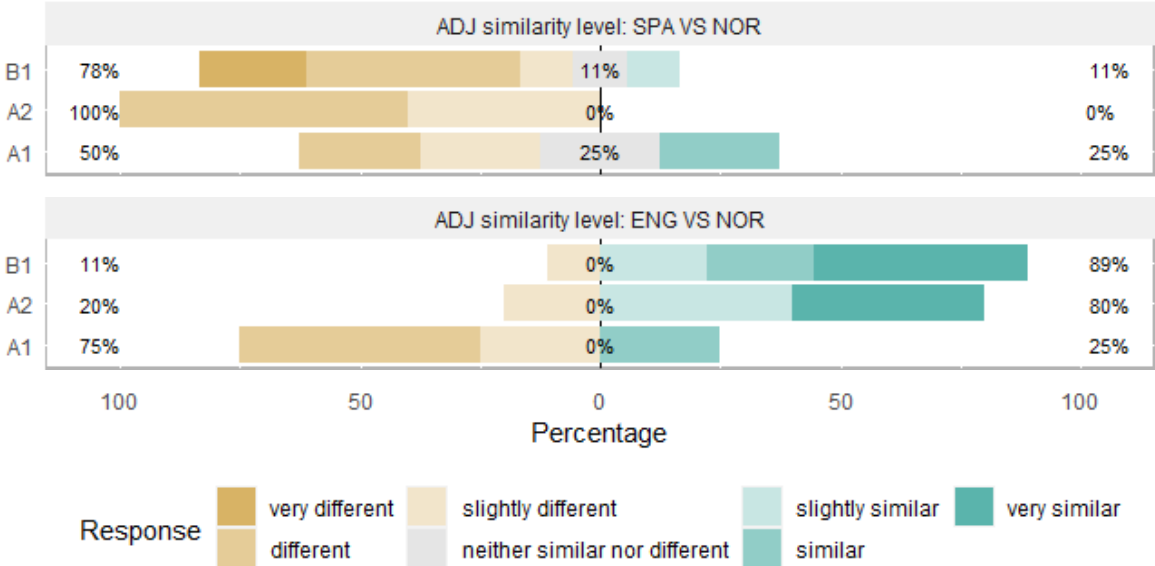
6.4.2.3 Adjective placement

In respect to the linguistic relatedness of adjective placement between Norwegian and participants' background languages, results pointed most of participants have considered this Norwegian property to be different from the one in Spanish and similar to its counterpart in English. Specifically, in regards to the Spanish relatedness to Norwegian, learners rated the language pair as mostly *very different* ($n=2$, 11.11%), *different* ($n=8$, 44.44%), or *slightly different* ($n=4$, 22.22%), while two participants rated them as *neither similar nor different* (11.11%), one as *slightly similar* (5.55%) and one as *similar* (5.55%). As for the English adjective placement relatedness level to Norwegian, on the contrary, the majority of participants rated the pair as *very similar* ($n=6$, 33.33%), *similar* ($n=3$, 16.66%), or *slightly similar* ($n=4$, 22.22%), while three learners rated them as *slightly different* (16.66%) and two of them as *different* (11.11%). In this scenario, the perceived linguistic proximity between both language pairs' adjective placement features was in accordance to the factual structural proximity of the languages in study, as adjectives are canonically post-nominal in Spanish, while being pre-nominal in English and Norwegian.

In an analysis sorted by Norwegian level, A2 and B1 proficiency learners had overall perceived the Spanish and Norwegian adjective placement, to distinct extents, as different, while A1 learners' responses pointed to a mixed result (see Figure 15). In the case of the A1 sub-group, participants rated the linguistic pair as *different*, *slightly different*, *neutral*, and *similar* ($n=1$, 25% for each rating type), which shows no agreement was reached in terms of the languages' (dis)similarity level in regards to adjective placement. As for the A2 level participants, ratings ranged between *different* ($n=3$, 60%) and *slightly different* ($n=2$, 40%). Finally, B1 proficiency level learners responses were of five types: *very different* ($n=2$,

22.22%), *slightly different* (n=1, 11.11%), *different* (n=4, 44.44%), *neither similar nor different* (n=1, 11.11%), and *slightly similar* (n=1, 11.11%). In the case of the adjective placement relatedness between English and Norwegian, the A1 sub-group's ratings have also presented a distinct pattern from more proficiently advanced counterparts. While A1 learners have mostly placed their ratings between *different* (n=2, 50%) and *slightly different* (n=1, 25%), with only one participant rating the pair as *similar* (25%), the majority of A2 participants have rated both languages as *slightly similar* (n=2, 40%) or *very similar* (n=2, 40%), with a single participant rating them as *slightly different* (20%). A similar pattern to A2 ratings was observed in B1 learners, as participants from this sub-group have mainly expressed these languages to be *slightly similar* (n=2, 22.22%), *similar* (n=2, 22.22%) or *very similar* (n=4, 44.44%), with only one *slightly different* (11.11%) rating type response.

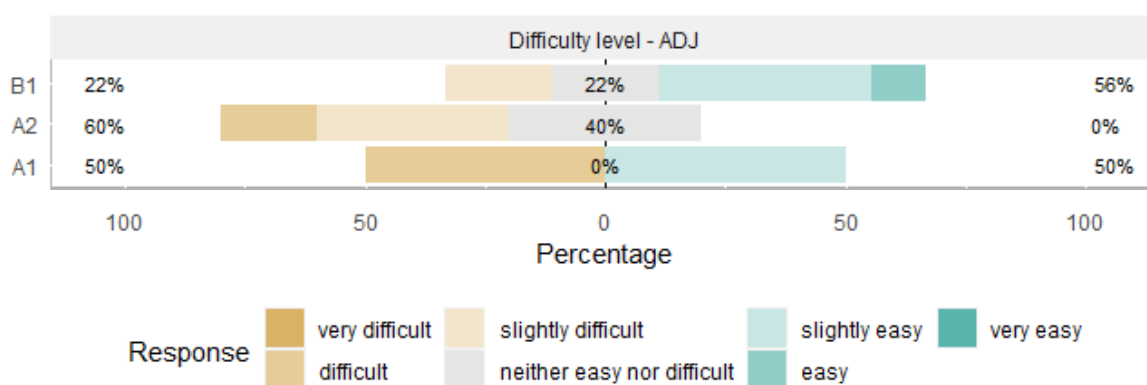
Figure 15 - Comparison of participants' responses on adjective placement similarity sorted by linguistic pair and Norwegian proficiency level.



As for the Norwegian adjective placement difficulty level, participants' ratings displayed mixed results. Overall, there were five types of responses: *difficult* (n=3, 16.66%), *slightly difficult* (n=4, 22.22%), *neither easy nor difficult* (n=4, 22.22%), *slightly easy* (n=6, 33.33%), and *easy* (n=1, 5.55%). None of the participants have rated the property as *very difficult* or *very easy*. These results show participants reached overall no agreement on the adjective placement difficulty level. In an analysis sorted by Norwegian proficiency level, a similar non-agreement pattern was observed in the A1 sub-group, as participants equally rated the property as either *difficult* or *slightly easy* (n=2, 50% for each response). On the other hand, A2 learners' responses pointed the property was overall perceived as *difficult* (n=1, 20%) or *slightly difficult*

($n=2$, 40%), with two participants rating it as *neither easy nor difficult* (40%). As for the B1 level learners, ratings indicated the property was mainly perceived as easy, having been distributed in four rating types: *slightly difficult* ($n=2$, 22.22%), *neither easy nor difficult* ($n=2$, 22.22%), *slightly easy* ($n=4$, 44.44%), and *easy* ($n=1$, 11.11%). As noticeable, A2 and B1 ratings shows a transition from the adjective placement perceived difficult level from overall difficult to easy. Participants' responses are summarized in Figure 16 for better visualization.

Figure 16 - Participants' responses on adjective placement difficulty level sorted by Norwegian proficiency level.

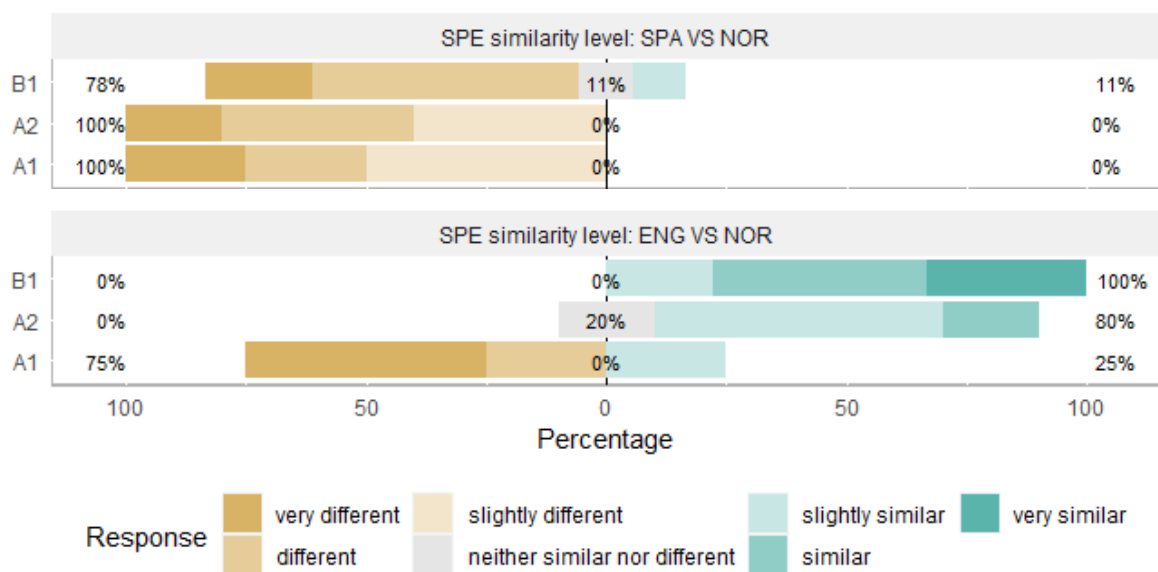


6.4.2.4 Subject pronoun expression

Results of the subject pronoun expression questions showed most of participants have considered this Norwegian property to be different from the one in Spanish and similar to its counterpart in English, a similar pattern found in the adjective placement property responses. In regards to the property's relatedness between Spanish and Norwegian, ratings were distributed as follows: *very different* ($n=4$, 22.22%), *different* ($n=8$, 44.44%), *slightly different* ($n=4$, 22.22%), *neither similar nor different* ($n=1$, 5.55%), and *slightly similar* ($n=1$, 5.55%). No responses were rated as *similar* or *very similar*. As for the similarity between the English and the Norwegian SPE systems, the majority of responses were rated as *slightly similar* ($n=6$, 33.33%), *similar* ($n=5$, 27.77%) or *very similar* ($n=3$, 16.66%). In addition, two learners rated the language pair SPE systems as *very different* (11.11%) and one participant, as *different* (5.55%). A single rating was neutral, i.e. *neither similar nor different* (5.55%). Once more, these overall results pointed the perceived linguistic proximity between both language pairs' SPE systems was in accordance to the factual structural proximity of the languages in study, as Spanish is a [+pro-drop] language whereas English and Norwegian are set as [-pro-drop] languages.

In an analysis sorted by Norwegian level, all three proficiency sub-groups have overall perceived the Spanish and Norwegian SPE systems as different, as displayed in Figure 17. In this context, A1 level learners perceived the property in both languages as being *very different* ($n=1$, 25%), *slightly different* ($n=2$, 50%) or *different* ($n=1$, 25%). A similar pattern was observed in the A2 level responses, which were distributed in *very different* ($n=1$, 20%), *slightly different* ($n=2$, 40%), and *different* ($n=2$, 40%). In respect to the B1 proficiency sub-group, ratings were of four types: *very different* ($n=2$, 22.22%), *different* ($n=5$, 55.55%), *neither similar nor different* ($n=1$, 11.11%), and *slightly similar* ($n=1$, 11.11%).

Figure 17 - Comparison of participants' responses on SPE similarity sorted by linguistic pair and Norwegian proficiency level.



As for the analysis of the SPE relatedness between English and Norwegian, results showed the A1 level sub-group was the only group to perceive both systems as mainly different, while more advanced learners, i.e. A2 and B1, identified the language pair to present a similar SPE system (see Figure 17). On the one hand, A1 responses were mainly placed as *very different* ($n=2$, 50%) or *different* ($n=1$, 25%), whereas one single rating was set as *slightly similar* (25%). On the other hand, A2 responses were mainly settled as *slightly similar* ($n=3$, 60%) and *similar* ($n=1$, 20%), with a single participant rating both systems as *neither similar nor different* (20%), while B1 learners have classified them as *slightly similar* ($n=2$, 22.22%), *similar* ($n=4$, 44.44%), and *very similar* ($n=3$, 33.33%).

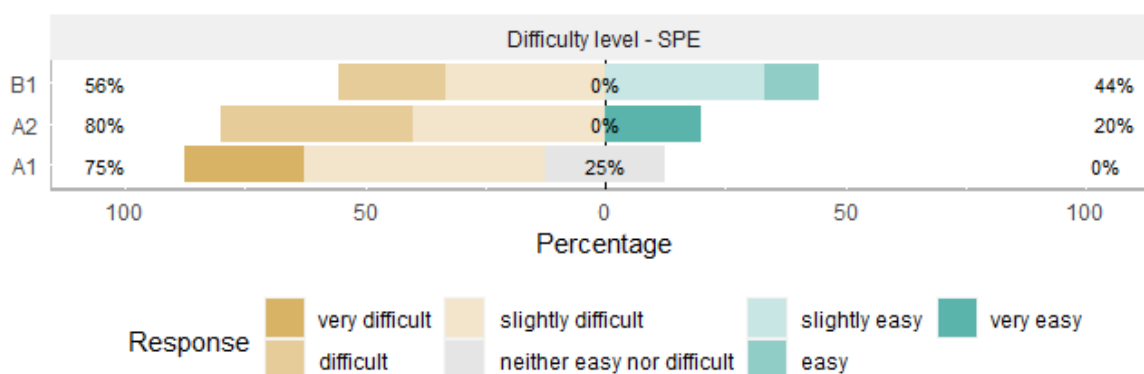
It is noteworthy that, despite participants overall perception of both the unrelatedness of Norwegian and Spanish and the relatedness of Norwegian and English in regards to this

property, the GJT results on SPE items (section 6.2.1.1) indicated the multilingual Spanish learners' performance was solely influenced by their L1 Spanish (non-facilitative CLI), whereas English played no facilitative CLI. Altogether, these results suggest the perceived structural proximity of the language pairs had no significant influence on participants' overall treatment of the Norwegian SPE.

Finally, in terms of the SPE difficulty level, participants have overall labeled this property as a difficult feature in terms of learning. Specifically, most of the responses were sorted as *very difficult* ($n=1$, 5.55%), *difficult* ($n=4$, 22.22%) and *slightly difficult* ($n=7$, 38.88%). In addition, three participants have perceived the property as *slightly easy* (16.66%), while the ratings of *neither easy nor difficult*, *easy*, and *very easy* received one response each ($n=1$, 5.55%). Once more, in an analysis by individual Norwegian proficiency level sub-groups, results showed the three levels have overall rated the property as difficult, to different extents (Figure 18). Specifically, the responses were distributed as follows: for the A1 sub-group, ratings were sorted as *very difficult* ($n=1$, 25%), *slightly difficult* ($n=2$, 50%), and *neither easy nor difficult* ($n=1$, 25%). As for the A2 level participants, responses were of three types: *difficult* ($n=2$, 40%), *slightly difficult* ($n=2$, 40%), and *very easy* ($n=1$, 20%). Finally, for the more advanced B1 level sub-group, ratings were distributed as *difficult* ($n=2$, 22.22%), *slightly difficult* ($n=3$, 33.33%), *slightly easy* ($n=3$, 33.33%), and *easy* ($n=1$, 11.11%).

As noticeable from Figure 18, despite the fact all sub-groups have overall perceived the Norwegian SPE as a challenging property, B1 learners have consider it less problematic (56%) as compared to A1 (75%) and A2 (80%) proficiency participants, with nearly half of responses (44%) laying within the 'easy' spectrum scale. Once again, one possible justification for this difference lies in the fact that learners' at more advanced developmental stages, such as the pre-intermediate (B1) level, are likely to have accumulated more substantial knowledge of the target language as compared to learners at earlier stages, such as beginner (A1) and elementary (A2) levels, leading the first to perceive the learning difficulty level of certain properties as less challenging as compared to latter.

Figure 18 - Participants' responses on SPE difficulty level sorted by Norwegian proficiency level.



Summary of the closed-ended questionnaire results

The closed-ended questionnaire on linguistic proximity was designed with two purposes, namely (i) to allow the investigation of participants' perception on the linguistic relatedness between their target and background languages, and (ii) to evaluate learners' perceived learning difficulty level of each of the four linguistic properties tested. Following the obtained results, participants' psychotypical proximity of all the language pairs tested, namely L1 SPA vs L2 ENG, L1 SPA vs L3 NOR, and L2 ENG vs L3 NOR, was in accordance with their factual typological proximity. In this context, overall responses indicated learners perceived L2 English and L3 Norwegian (Germanic languages) to be similar, whereas Spanish, a Romance language, was pointed to be typologically different from both English and Norwegian.

In terms of the perceived structural proximity of languages, however, participants were unable to perceive the properties in which Spanish was similar to Norwegian, having overgeneralized the language pair was mainly 'different', while correctly perceived English was similar to Norwegian in two of the properties tested, namely adjective placement and SPE, and different in the other two, namely possessives gender agreement and number concord. In sum, these responses suggested the linguistic proximity was solely holistically realized as for the pair L1 Spanish – L3 Norwegian. On the other hand, the linguistic relatedness between L2 English – L3 Norwegian was both holistically and property-by-property perceived.

Finally, participants have realized three of the morphosyntactic properties tested as overall difficult features in terms of learning, namely the possessives gender agreement, number concord, and SPE. As for the adjective placement property, no consensus was reached on this feature's difficult level, with responses been equally distributed between the 'difficult' and 'easy' spectra.

7 Analysis and discussion

As previously presented (see section 4.1), the current thesis addressed two main research questions:

RQ 1: Which of the previously acquired languages is the source of cross-linguistic influence in adult third language acquisition? i.e. is the source of transfer driven by the (i) language status (order of acquisition) or (ii) the typological proximity between the L3 and L1/L2?

RQ 2: Is the cross-linguistic influence on adult third language acquisition of holistic or property-by-property nature?

In view of this, section 7.1 answers to these proposed questions based on the analysis of the findings of the current study and the predictions of the five main competing L3 models investigated (see section 4.1). In addition, section 7.2 further explores the findings in light of the investigated influential factors in CLI in L3A (see section 2.3).

7.1 The source and nature of CLI in adult L3A

First, in regard to the performance of the two bilingual control groups, i.e. L1 SPA – L2 NOR and L1 ENG – L2 NOR, this study predictions were as follows. Given the morphosyntactic properties in investigation, the current project expected the Spanish bilingual controls to perform at ceiling in the treatment of post-nominal possessives gender agreement and definite article number concord due to the similarity of features between their L1 SPA and L2 NOR. On the other hand, this group was expected to face more challenges in their treatment of the Norwegian adjective placement and SPE due to the differences presented in both languages' systems. Conversely, the English bilingual group was predicted to achieve ceiling performance in the treatment of L2 NOR adjective placement and SPE while comparatively facing more difficulties in their judgment of items featuring possessives gender agreement and number concord. This prediction was similarly based on the language pair structural similarities. Therefore, comparatively, the Spanish bilingual group was expected to achieve higher scores in the treatment of possessives gender agreement and number concord than the English controls, while conversely performing at lower target-like manner in the judgement of adjective placement and SPE. The results of the GJT, however, did not fully support these predictions. Although the Spanish controls did perform at significantly higher rates as

compared to their English counterparts in the treatment of possessives gender agreement and at lower target-like manner in the judgement of SPE items, no significant differences were found between both control groups' performances on the number concord and adjective placement properties. While the number concord property proved to be a challenging feature for both bilingual control groups, with overall target-like ratings falling under the set acquisition threshold (<75%), the adjective placement property was proven to be relatively easy, as both groups performed at high target-like manner (>80%). These latter results suggest the acquisition difficulty level of a given property to be an influencing factor in CLI.

H1 - The L1 Factor

Following the L1 Factor, the multilingual Spanish target group performance would be predicted to be solely influenced by their L1 Spanish grammar, while factors such as language proximity and psychotypology are overridden by the L1 privileged status. The overall results of both the GJT and the closed-ended questionnaire promoted by the current investigation have found evidence for this factor. In the GJT, the Spanish multilingual participants have performed statistically alike their Spanish bilingual counterparts while scoring significantly different from the English controls in two of the tested properties. In the treatment of Norwegian possessives gender agreement, in which Spanish would be expected to have a facilitate effect on L1 participants' performance since it is also a [+gender] language, both L1 Spanish target and control groups have behaved significantly more accurately than the English controls, to which the L1 is set a [-gender]. Conversely, in the Norwegian SPE [-pro-drop] items, in which L1 Spanish would be predicted to play a non-facilitative effect [+pro-drop], both L1 Spanish groups have performed significantly less-accurately than the English control group, to which L1 English [-pro-drop] has played a facilitative effect.

As for the closed-ended questionnaire, results pointed the multilingual participants perceived the language proximity between L1 SPA – L2 NOR on a holistic basis, i.e. from a psychotypological proximity, in which Spanish was generally considered as a different language from Norwegian. Moreover, participants have overgeneralized the typological unrelatedness of both languages in their perception of structural proximity, since responses highlighted participants perceived all four Norwegian tested properties to be different from Spanish. Conversely, subjects have perceived the language proximity between the pair L2 ENG – L3 NOR both from a psychotypological proximity, i.e. holistic basis, and structural proximity, i.e. property-by-property basis. In a parallel with the GJT results, however, ratings pointed the

multilingual group's performance was influenced by their L1 Spanish independently of participants showing to be (un)aware of the (dis)similarities of the presented Norwegian properties between their L1 Spanish and L2 English. For instance, while the multilingual group failed to perceive L1 Spanish as similar to L3 Norwegian in terms of possessives gender agreement, the GJT scores suggested a facilitative effect of L1 Spanish over the multilingual group's performance (83.33% of overall target-like treatment). Another piece of evidence was found in participants' perceived SPE structural similarity between L3 Norwegian and their background languages. Although subjects' responses pointed to a perceived L1 Spanish SPE dissimilarity and a L2 English SPE similarity to the L3 Norwegian subject pronoun system, GJT results showed a non-facilitative effect of L1 Spanish on the multilingual group performance, whereas no facilitative effect of L2 English was statistically proven. These results, hence, imply both the (psycho)typological and the perceived structural proximities to have been overridden by the L1 privilege factor.

In light of these, the findings of both the GJT and the closed-ended questionnaire are best supported by the L1 Factor. In this context, the findings of the current investigation answer both proposed research questions as follows: (RQ1) the current thesis found evidence for the L1 as the main and sole source language of cross-linguistic influence in adult third language acquisition, thus pointing the source of transfer was driven by the language status (order of acquisition) rather than by the typological proximity between the L3 and the L1/L2. As the L1 Spanish was found to be transferred in its entirety into the L3 Norwegian while the L2 English remained neutral, not transferring any features to the L3, the CLI was characterized as being of holistic nature (RQ2).

H₂ - The L2 Status Factor (L2SF)

This model would predict the multilingual Spanish group's performance to be influenced by L2 English, which would further expect subjects to perform at target-like manner in their treatment of the Norwegian adjective placement and SPE, while behaving non-target like in the judgement of possessives gender agreement and number concord. Findings of this study, nevertheless, did not support this scenario. While all learning groups, i.e. multilingual Spanish target group and Spanish and English bilingual controls, performed statistically alike in their treatment of number concord and adjective placement, the Spanish multilinguals performed statistically alike the Spanish bilinguals in their treatment of possessives gender agreement and SPE. In their ratings of possessives gender agreement, multilingual participants performed in

target-like manner (83.33% target-rates), significantly outperforming the English controls (66.34% target-like rates). On the other hand, the Spanish multilinguals scored significantly lower (78.47% target-like rates) in their treatment of the Norwegian SPE as compared to the English bilingual controls (89.42% target-like rates). Furthermore, in contradiction to the L2SF model, which predicts speakers with a higher L2 proficiency to transfer more L2 features than those with a lower L2 proficiency, multilingual Spanish participants with pre-intermediate (B1), intermediate (B2), and advanced (C1) L2 English levels displayed no significant accuracy differences across the four properties tested, which indicates the L2 proficiency had no effect on their performance. The aforementioned results, therefore, show the L2SF predictions were not supported by the findings of the current research.

H3 - The Typological Primacy Model (TPM)

According to the TPM, in which the typological similarity between the L1/L2 and the L3 is the key factor in determining which of the previous acquired languages is the one transferred into the L3, the Spanish multilingual group would be expected to transfer all L2 ENG properties on a holistic basis, as English is typologically closer to Norwegian (both are Germanic languages) as compared to Spanish (Romance language). In this context, multilinguals would be expected to pair with the bilingual English controls, behaving in a target-like manner in the treatment of Norwegian adjective placement and SPE as these properties present similar configurations to English. Conversely, the TPM would predict the multilingual Spanish group to be outperformed by the Spanish bilingual controls in the judgement of possessives gender agreement and definite article number concord items, as these features are absent in English. However, as previously presented, the findings of the GJT found both L1 Spanish groups, i.e. the Spanish multilingual and the bilingual Spanish groups, to have performed statistically alike, having outperformed the English controls in the treatment of possessives gender agreement items, and being outperformed by the same in the judgement of SPE items.

In terms of the psychotypological proximity, these findings could be interpreted as a result of L3 learners' misanalysis of the typological proximity between their L1 Spanish and L2 English in relation to L3 Norwegian, in which the L1 Spanish could have been mistakenly identified as the closest typological language to L3 Norwegian. The responses obtained from the closed-ended questionnaire, however, proved participants were aware of the (dis)similarities of English and Norwegian both from a typological and a structural proximity levels. Specifically, subjects were able to identify the language pair as typologically closer as

compared to Spanish, in addition to correctly pin-pointing the adjective placement and SPE properties shared similar features in English and Norwegian, while recognizing the Norwegian possessives gender agreement and number concord properties were dissimilar to English. Moreover, subjects' expressed they considered having a previous knowledge of English to be helpful in the learning process of L3 Norwegian, while no agreement was reached in terms of the helpfulness of L1 Spanish. Altogether, these GJT and closed-ended results show evidence against the predictions of the TPM model.

H4 - The Cumulative Enhancement Model (CEM)

In accordance to the CEM, the CLI on L3A can occur from either or both the L1 and L2, being either facilitative or remaining neutral, as non-facilitative transfer is accounted not to occur at all. In this scenario, the Spanish multilingual participants would be predicted to behave in a target-like manner in all the four properties due to facilitative transfer from L1 Spanish in the possessives gender agreement and number concord properties in addition to facilitative transfer from L2 English in the adjective placement and SPE features. Conversely, there would be no negative effect of L2 English in the ratings of possessives gender agreement and definite article number concord, in which these features are absent, nor non-facilitative transfer from L1 Spanish in the adjective placement and SPE, to which Spanish is set as a canonically N-ADJ and [+pro-drop] language, respectively. In this sense, multilinguals were expected to pair with the Spanish bilingual controls in regards to the POSS and NUM properties' ratings, whereas matching with the English controls in terms of ADJ and SPE performance.

Results of the GJT, however, did not corroborate to these model's predictions. While the Spanish multilingual group performance on possessives gender agreement items did display a facilitative effect of L1 Spanish, matching with the one of Spanish bilinguals and significantly outperforming the English controls, their performance on Norwegian SPE ratings showed non-facilitative transfer was possible, as multilinguals once again paired with Spanish bilinguals, with both groups performing with significantly lower mean scores than the English bilinguals.

H5 - The Linguistic Proximity Model (LPM)

The LPM advocates the CLI on L3A can be derived from both the L1 and L2, as language acquisition is a cumulative process. In addition, this model states the CLI occurs in a property-by-property basis, in which both facilitative and non-facilitative transfer are possible, being the first based on the structural similarity of previously acquired language and the L3 and the latter,

a possible result of speakers' incorrect assumption that a linguistic property is shared between one of the previously acquired languages and the L3, insufficient input, or due to the simultaneous activation of competing similar features from both previous languages. In this context, the model would predict the Spanish multilingual group's accuracy, measured by means of the GJT, to be in between the two bilingual groups, i.e. the Spanish and English controls, due to both facilitative and non-facilitative influence from L1 Spanish and L2 English. The GJT results, however, did not support the LPM predictions, as previously presented, the Spanish multilingual group performed statistically alike the Spanish controls in all four properties tested, in which (i) both groups outperformed the English bilinguals in their treatment of possessives gender agreement (facilitative CLI from L1 Spanish), while, contrarily, (ii) being outperformed by the English bilingual group in their judgment of Norwegian SPE items (non-facilitative CLI from L1 Spanish). In regards to the remaining properties, namely number concord and adjective placement, all groups performed statistically alike, being the number concord an overall challenging property to all Norwegian learning groups, and the adjective placement, a comparatively easy feature which had overall already been acquired by all groups by the time of testing.

In respect to the non-facilitative transfer found in the treatment of SPE items, the LPM could account it as a possible result of L3 learners' misanalysis of the SPE structural similarity between their L1 Spanish and L2 English in relation to L3 Norwegian, in which the L1 Spanish SPE system could have been mistakenly identified as structurally more similar to the L3 Norwegian SPE as compared to the one of L2 English. However, the responses obtained from the closed-ended questionnaire proved participants were aware of the SPE structural similarity of English and Norwegian. In addition, subjects' responses also pointed they perceived the Norwegian SPE system as mainly 'different' from the Spanish SPE, which is classified as a [+pro-drop] language. Therefore, following the aforementioned GJT and closed-ended results, the LPM predictions were not corroborated by the findings of the current study.

7.2 Triggering factors of CLI in L3A

In addition to the investigation of the source and nature of CLI in adult L3A, the design and participants' linguistic profile of the present study have also allowed an analysis of current proposed influencing factors in triggering this phenomenon, namely, the (i) the (psycho)typological proximity, (ii) L2 and L3 proficiency levels, and (iii) individual linguistic

properties' acquisition difficulty level (see section 2.3). The findings of the GJT and closed-ended questionnaire revealed the following.

In respect to the (psycho)typological proximity, results showed no significant influence of this factor on the Spanish multilingual participants' performance. Firstly, in regards to the typological proximity, the linguistic combination under investigation would expect a main influence from L2 English (following the TPM), since both English and Norwegian are Germanic languages, whereas Spanish is part of the Romance family branch. Nevertheless, as previously presented, the L3 Norwegian learners performed statistically alike the Spanish bilinguals, pointing their previous knowledge of L2 English was not a deterministic factor in their performance. As for the psychotypological proximity, the findings obtained from the GJT would be justified by the TPM (Rothman, 2011, 2013, 2015) as a result of learners' misanalysis of the typological proximity, in which L1 Spanish would have been mistakenly perceived as the typologically closest language to L3 Norwegian instead of the L2 English. Participants' responses on the closed-ended questionnaire found no evidence for this prediction, as they were proven to be aware of the typological similarity between their L2 English and L3 Norwegian while also correctly identifying the typological dissimilarity between their L1 Spanish with both L2 English and L3 Norwegian. Therefore, these results stand in contradiction to the findings reported by Rothman (2011, 2013, 2015).

In terms of the L2 and L3 proficiency factor, the current study found no significant effect of L2 proficiency level on L3 Norwegian acquisition (see section 6.3), a result which stands in contradiction to the earlier findings supported by Bardel and Falk (2007). On the other hand, the GJT results revealed a strong effect of L3 Norwegian proficiency, which indicated an overall advantage for pre-intermediate (B1) learners over beginner (A1) and elementary (A2) participants. In sum, B1 level subjects have significantly outperformed both their A1 and A2 counterparts in the treatment of three of the four tested Norwegian properties, namely possessives agreement, number concord, and SPE. As for the fourth property, adjective placement, A2 level participants were strongly less sensitive to adjective placement violations as compared to B1 learners. In all four features, A1 and A2 behaved significantly alike. These results suggest that, at early stages of L3A, such as in the case of beginner and elementary learners, linguistic representations such as grammatical features may still be relatively unstable, which could lead to stronger effects of CLI as the activation level of previously acquired languages might be higher. Conversely, learners' at more advanced developmental stages, such as pre-intermediate learners, may present lower effects of CLI in their L3 as they accumulate

substantial knowledge of the target language while gaining a better control to inhibit representations from previously acquired languages.

Finally, the current research findings pointed the difficulty acquisition level of individual linguistic properties as a triggering factor in CLI. This conclusion is based on the fact that, in two of the tested properties, namely number concord and adjective placement, no significant differences were found in regards to any of the Norwegian learning groups. In this context, while the number concord was proven to be an overall challenging property, with none of the Norwegian learning groups reaching the accuracy rate criterion of property acquisition (75%), the adjective placement, on the contrary, was comparatively less challenging, as all three Norwegian learning groups performed with high target-like rates (>80%). These differences in performance across both properties suggests functional morphology to be generally more challenging as compared to word order configurations, as the latter is more prominent in the language acquisition process, being frequently acquired at early stages (McDonald, 2000, 2006).

In face of these results, the individual properties' difficulty level of acquisition could help explaining the differences found in the L3 Norwegian learnability across features. It is noteworthy, however, that the Spanish multilingual participants have performed at overall target-like manner in the treatment of another feature involving functional morphology, namely possessives gender agreement (83.33%). This comparative result have two possible interpretations: in the one hand, the Norwegian definite article realized as an independent word, featured in the number concord items, is less commonly used as compared to its definite form expressed as a suffix on the noun. This fact could have influenced on participants' ratings due to its comparatively lower availability of input, while the possessives gender agreement is relatively common in the Norwegian language input, being, therefore, more salient. On the other hand, it could be the case that a variation on the difficulty level of acquisition within the functional morphology category is presented. Nevertheless, those observations need to be further examined in future research before conclusive interpretations can be made in this regard.

In sum, these results are in line with Ben Abbes (2016, 2020) and Slabakova's (2016) findings that some linguistic features are inherently more difficult to acquire as compared to others. In addition, the findings also corroborates to the assertion that morphosyntactic properties are not all equal in respect to the amount of time they require to be develop by learners (Ben Abbes, 2016).

8 Conclusion

The current thesis examined the topic of CLI in adult L3A, having as the basis of investigation the acquisition of L3 Norwegian morphosyntax by sequential L1 Spanish – L2 English speakers. In order to explore this issue, two main research questions were posed, respectively regarding the source and the nature of CLI at developmental stages of L3 acquisition. Previous research on the topic are substantial, but the answer to the proposed questions are still intensively debated as studies have pointed to diverging results. Based on the morphosyntactic domain, the present thesis grounded the study's predictions on five main L3A competing models, composed by holistic basis models - 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), and by property-by-property basis models - the Cumulative Enhancement Model (Flynn et al., 2004) and the Linguistic Proximity Model (Westergaard et al., 2017). These models' predictions were tested by means of two main tasks, namely a GJT and a closed-ended questionnaire on linguistic proximity.

Results of the GJT showed the multilingual Spanish target group have overall patterned with the bilingual Spanish control. In the possessives gender agreement and SPE conditions, both L1 Spanish outperformed the English bilinguals in their treatment of possessives gender agreement due to facilitative CLI from L1 Spanish, while being outperformed by the English controls in their judgment of Norwegian SPE items due to non-facilitative CLI from L1 Spanish. In respect of the two remaining conditions, namely number concord and adjective placement, all Norwegian learning groups performed statistically alike, being the number concord an overall challenging property to all Norwegian learning groups, as none of them achieved the accuracy criterion rate of 75% for the acquisition of this property, and the adjective placement, a comparatively unproblematic condition for all groups (above 80% accuracy).

As for the closed-ended questionnaire, findings pointed participants' psychotypological proximity of all language pairs tested was in accordance with their factual typological proximity. In this context, overall responses indicated learners perceived L2 English and L3 Norwegian to be similar (Germanic languages), whereas Spanish (Romance language) was correctly realized to be typologically different from both English and Norwegian. In regards of the perceived structural proximity of languages, however, L3 learners were unable to perceive the properties in which Spanish was similar to Norwegian, having overgeneralized the language pair as mainly 'different' across all features, while correctly perceiving English as similar to

Norwegian in the adjective placement and SPE properties, and different in the possessives gender agreement and number concord features. In sum, these responses suggested the linguistic proximity was solely holistically realized as for the pair L1 Spanish – L3 Norwegian, whereas the linguistic relatedness between L2 English – L3 Norwegian was both holistically and property-by-property perceived. Despite these results, the GJT performance of L3 learners found no effects of neither the psychotypical proximity nor the perceived structural similarity, as this group performed in target-like manner in the treatment of possessives gender agreement in spite of falling to perceive the property's similarity between L1 Spanish and L3 Norwegian. Another piece of evidence was found in the fact L3 learners were outperformed by the English controls, while pairing with Spanish bilinguals, in their judgement of SPE items despite correctly perceived the dissimilarity of Spanish and the similarity of English in regards to L3 Norwegian SPE system.

Therefore, it follows from the findings of the present study that the CLI in adult L3A is characterized by a holistic nature, having as its main and sole source of transfer the L1. As presented in section 7, these results, overall, are best captured by the L1 Factor model (Herms, 2010, 2014), which predicts the L1 is the selected language to be holistically transferred into the L3, overriding the effects of both language proximity and psychotypology.

Finally, this study has also found the L3 proficiency level and difficulty acquisition level of individual linguistic properties as triggering factors of CLI. In regards to the first, the GJT indicated an overall significant advantage for pre-intermediate (B1) learners over beginner (A1) and elementary (A2) participants in the ratings of L3 Norwegian morphosyntax. As presented in section 7.2, these results suggest that, at early stages of L3A, linguistic representations are still relatively unstable, leading to stronger effects of CLI as the activation level of previously acquired languages might be higher, whereas at more advanced developmental stages, learners have already accumulated substantial knowledge of the target language while gaining a better control to inhibit representations from previously acquired languages. As for the latter, individual linguistic properties were found to pose different learning difficulty levels, being the complexity and saliency of features important factors in the L3A CLI. This conclusion is driven from participants' accuracy scores of the GJT, in which the four tested morphosyntactic properties presented different developmental slopes, being the number concord the most challenging, and the adjective placement, the one to pose less difficulties to Norwegian learners. As a final remark, L3 learning participants' perceived three of the morphosyntactic properties tested as overall difficult features in terms of learning, namely the possessives gender

agreement, number concord, and SPE while no consensus was reached in regards to adjective placement. Despite their perception, subjects scored relatively high mean scores in their treatment of possessives (83.33%) and SPE (78.47%), suggesting the perceived linguistic complexity of individual features may not be a strong factor in determining learners' accuracy levels. This interpretation, nevertheless, is provided with caution, as further research is needed for more conclusive interpretations.

In sum, the findings here reported extend the existing knowledge on CLI in L3A research, in special by shedding light in the studies on psychotypical proximity and perceived structural similarity. While the findings of the current thesis can only be generalized in the presence of further similar CLI in L3A studies, it is certain that the L3A field remains a vast and exciting area of research as, to quote from Wang (2013, p.99), “multilingualism is becoming more of a norm than an exception”.

Limitations and directions for future research

As any other research, it is important to acknowledge the current study was not free from limitations. Firstly, the Norwegian proficiency test employed was limited to placing learners within beginners (A1), elementary (A2) and pre-intermediate (B1) levels only. In this way, the test fails to acknowledge learners from more advanced proficiencies, which, despite participants self-report, could result in a more heterogeneous B1 group as compared to the A1 and A2 ones, as possible intermediate (B2) and advanced (C1) learners could be falsely placed within the tests' highest possible level (B1). In future studies on L3 Norwegian, participants' knowledge needs to be better controlled. In spite of the current non-availability of a Standardized Norwegian proficiency test, using a test with larger proficiency scale options, such as the CEFR (A1 to C1), could enhance the reliability of learners' proficiency level placement. Secondly, the overall number of participants in this study was relatively small, possibility resulted from the strict criteria used for the inclusion of participants in the experiment. In special, the Spanish bilingual controls were even less numerous than the other groups, a consequence of the English status as the most commonly used language in educational and working related international environments in Norway. The linguistic reality of the country, thus, must be taken into account in future experimental designs aiming to investigate CLI in L3A, such as the target and control groups are better balanced in terms of number of participants. Finally, future research should also account for factors such as saliency in the input and linguistic complexity of properties in order to have a better balance the linguistic features

combination investigated. In the current thesis, both Norwegian properties which were similar to Spanish involved functional morphology, which is attested to be inherently more difficult to acquire as compared to other linguistic features, such as word order, present in the adjective placement feature used in the experiment as a property in which Norwegian is similar to English.

References

- Agirre, A., & García Mayo, M. P. (2013). Gender agreement in L3 English by Basque/Spanish bilingual. *Linguistic Approaches to Bilingualism*, 3(4), 415-447.
- Alotaibi, A. M., & Alotaibi, M. A. (2017). On the Acquisition of the Prenominal Adjective Order by Kuwaiti EFL Learners. *Advances in Language and Literary Studies*, 8(1), 1-8.
- Anderssen, M., Lundquist, B., & Westergaard, M. (2018). Cross-linguistic similarities and differences in bilingual acquisition and attrition: possessives and double definiteness in Norwegian heritage language. *Bilingualism: language and cognition*, 21(4), 748-764.
- Anderssen, M., & Westergaard, M. (2010). Frequency and economy in the acquisition of variable word order. *Lingua*, 120, 2569-2588.
- Androutsopoulou, A., Español–Echevarría, M., & Prévost, P. (2006). On the acquisition of the pre-nominal placement of evaluative adjectives in L2 Spanish. In J. Bruhn de Garavito & E. Valenzuela (eds.), *10th Hispanic Linguistics Symposium*, 1-12.
- Arıbaş, D., & Cele. F. (2021). Acquisition of articles in L2 and L3 English: the influence of L2 proficiency on positive transfer from L2 to L3. *Journal of Multilingual and Multicultural Development*, 42(1), 19-36.
- Arias-Trejo, N., Cantrell, L., Smith, L., & Canto, E. (2014). Early comprehension of the Spanish plural. *Journal of Child Language*, 41, 1356-1372.
- Babatsouli, E., & Nicoladis, E. (2019). The acquisition of English possessives by a bilingual child: Do input and usage frequency matter? *Journal of Child Language*, 46(1), 170-183.
- Bardel, C., & Falk, Y. (2007). The role of second language in third language acquisition: The case of Germanic syntax. *Second Language Research*, 23(4), 459-484.
- Barker, C. (2011). Possessives and relational nouns. In K. von Stechow, C. Maienborn, & P. Portner (eds.), *Semantics: An International Handbook of Natural Language Meaning*, Vol. 2, 1109-1130.
- Ben Abbes, K. (2016). *The acquisition of French morpho-syntactic properties: Cross-linguistic influence in the learning of L3 French by Turkish/Spanish speakers who learned*

English as an L2 (Doctoral dissertation, University of Essex, Essex, England). Retrieved from <http://repository.essex.ac.uk/19104/>

Ben Abbes, K. (2020). Transfer in L3 Acquisition: Is it Holistic or Property-Based? *International Journal of Language and Linguistics*, 7(3), 43-59.

Bentzen, K. (2014). Subject and object extraction from embedded clauses. *Nordic Atlas of Language Structures Journal*, 1(1), 435-446.

Bernstein, J. (2005). On the morpho-syntax of possessive constructions. *Recherches linguistiques de Vincennes*, 34, 55-76.

Berry, R. (2012). *English Grammar*. New York: Routledge.

Bertolotti, V. (2014). *Pronombres posesivos en el español rioplatense: tres casos de reanálisis* [Possessive pronouns in Río de la Plata Spanish: three cases of reanalysis]. *Traslaciones: Revista Latinoamericana de Lectura y Escritura*, 1(1), 56-74.

Börjars, K., Denison, D., Krajewski, G., & Scott, A. (2013). Expression of possession in English: The significance of the right edge. In K. Börjars, D. Denison, & A. Scott (eds.), *Morphosyntactic categories and the expression of possession*, 123-148.

Brown, M. (2020). Grammatical gender acquisition in sequential trilinguals: Influence of a gendered L1 vs. L2. *Proceedings of the Linguistic Society of America*, 5(1), 331-344.

Bross, F. (2019). Acceptability ratings in Linguistics: A practical guide to Grammaticality Judgments, data collection, and statistical analysis. Version 1.02. Mimeo. Retrieved from www.fabianbross.de/acceptabilityratings.pdf

Busterud, G., Lohndal, T., Rodina, Y., & Westergaard, M. (2019). The loss of feminine gender in Norwegian: A dialect comparison. *Journal of Comparative Germanic Linguistics*, 22, 141-167.

Chomsky, N. (1981). *Lectures on government and binding*. Dordrecht: Foris.

Corbett, G. (2000). *Number*. Cambridge: Cambridge Textbooks in Linguistics.

Council of Europe. (2001). *Common European framework of reference for languages: Learning, teaching, assessment*. Cambridge, U.K: Press Syndicate of the University of Cambridge.

De Angelis, G. (2007). *Third or additional language acquisition*. Clevedon, UK: Multilingual Matters.

Di Garbo, F. (2020). Plural marking on noun-associated forms: a synchronic and diachronic typological study of Cushitic languages. *STUF - Language Typology and Universals*, 73(3), 363-401.

Eguren, L. (2018). Evaluative prenominal possessives in Spanish. *Borealis: An International Journal of Hispanic Linguistics*, 7(1), 1-26.

Eisenbeiss, S., Matsuo, A., & Sonnenstuhl, I. (2009). Learning to encode possession. In W. B. McGregor (ed.), *The Expression of Possession*, 143-212.

Faarlund, J. T. (2013). The pro cycle. In E. van Gelderen, J. Barðdal, & M. Cennamo (eds.), *Argument Structure in Flux: The Naples-Capri Papers*, 257-284.

Faarlund, J. T. (2019). *The syntax of Mainland Scandinavian*. Oxford: Oxford University Press.

Faarlund, J. T., & Hagemann, K. (2014). Subjects and objects in Germanic and Romance. In K. Bech, & K. Gunn Eide (eds.), *Information structure and syntactic change in Germanic and Romance languages*, 295-312.

Faarlund, J. T., Lie, S., & Kjell-Ivar V. (1997). *Norsk referansegrammatikk* [A reference grammar of Norwegian]. Oslo: Universitetsforlaget.

Fábregas, A., Anderssen, M., & Westergaard, M. (2019). A comparison of Norwegian and Spanish L1 acquisition of possessive constructions. *The Journal of Comparative Germanic Linguistics*, 22, 115-140.

Fabricius-Hansen, C., Helland, H., Pitz, A. (2017). Possessives in L2 and translation: basic principles and empirical findings. In C. Fabricius-Hansen, B. Behrens, A. Pitz, & H. Hellans (eds.), *Oslo Studies in Language*, 9(2), 3-39.

- Falk, Y., & Bardel, C. (2011). Object pronouns in German L3 syntax: Evidence for the L2 Status Factor. *Second Language Research*, 27, 59-82.
- Flynn, S., Foley, C., & Vinnitskaya, I. (2004). The Cumulative- Enhancement Model for language acquisition: Comparing adults' and children's patterns of development in first, second and third language acquisition of relative clauses. *The International Journal of Multilingualism*, 1, 3-16.
- Foryś-Nogala, M., Broniś, O., Opacki, M., & Otwinowska, A. (2020). Cross-linguistic influences, language proficiency and metalinguistic knowledge in L3 Italian subject placement. *International Journal of Multilingualism*, 1-21.
- Ghezlou, M., Koosha, M., & Lotfi, A. (2018). Acquisition of adjective placement by L3 Learners of English: Evidence for the L2 Status Factor International. *Journal of Applied Linguistics & English Literature*, 7(2), 175-184.
- Halmøy, M. (2008). Number, (In)definiteness and Norwegian Nouns. In A. Grønn (ed.), *Proceedings of SuB12*, 180-195.
- Hermas, A. (2010). Language acquisition as computational resetting: verb movement in L3 initial state. *International Journal of Multilingualism*, 7(4), 343-362.
- Hermas, A. (2014). Multilingual transfer: L1 morphosyntax in L3 English. *International Journal of Language Studies*, 8(2), 10-24.
- Holmberg, A., Nayudu, A., & Sheehan, M. (2009). Three partial null-subject languages: A comparison of Brazilian Portuguese, Finnish, and Marathi. *Studia Linguística*, 63(1), 59-97.
- Ihsane, T. (2003). A typology of possessive modifiers. In M. Coene, & Y. D'Hulst (eds.), *From NP to DP*, 23-42.
- Jakubiček, M., Kilgarriff, A., Kovář, V., Rychlý, P., & Suchomel, V. (2013). The TenTen corpus family. In *7th International Corpus Linguistics Conference CL*, 125-127.
- Jensen, I., Mitrofanova, N., Anderssen, M., Rodina, Y., Slabakova, R., & Westergaard, M. (2021). Crosslinguistic influence in L3 acquisition across linguistic modules. *International Journal of Multilingualism*, 1-18.

- Judy, T. & Rothman, J. (2010). From a superset to a subset grammar and the semantic compensation hypothesis: subject pronoun and anaphora resolution evidence in L2 English. In K. Franich, K. M. Iserman, & L. L. Keil (eds.), *Proceedings of the 34th annual Boston University Conference on Language Development*, 197-208.
- Julien, M. (2003). Double definiteness in Scandinavian. In A. Dahl, K. Bentzen, & P. Svenonius (eds.), *Proceedings of the 19th Scandinavian Conference of Linguistics*, 31(1), 230-244.
- Kellerman, E. (1979). Transfer and non-transfer: where we are now. *Studies in Second Language Acquisition*, 2, 37-57.
- Kellerman, E. (1983). Now you see it, now you don't. In S. Gass & L. Selinker (eds.), *Language transfer in language learning*, 112-134.
- Kellerman, E. (1986). An eye for an eye: Crosslinguistic constraints on the development of the L2 lexicon. In E. Kellerman & M. S. Smith (eds.), *Crosslinguistic influence in second language acquisition*, 35-48.
- Kinn, K. (2016). Referential vs. non-referential null subjects in Middle Norwegian. *Nordic Journal of Linguistics*, 39(3), 277-310.
- Kouider, S., Halberda, J., Wood, J., & Carey, S. (2006). Acquisition of English number marking: the singular-plural distinction. *Language learning and development*, 2(1), 1-25.
- Lozano, C. (2014). Word order in second language Spanish. In K. L. Geeslin (ed.), *The Handbook of Spanish Second Language Acquisition*, 287-310.
- Lundquist, B., Anderssen, M., Lohndal, T., & Westergaard, M. (2020). Variation across individuals and domains in Norwegian heritage language. *Oslo Studies in Language*, 11(2), 251-267.
- Lundquist, B., & Vangsnes, Ø. (2018). Language separation in bidialectal speakers: Evidence from eye tracking. *Frontiers in Psychology*, 9, 1-18.
- Lødrup, H. (2011). Norwegian possessive pronouns: phrases, words or suffixes? In M. Butt & T. H. King (eds.), *Proceedings of the LFG11 conference*, 383-403.

- McDonald, J. L. (2000). Grammaticality judgments in a second language: Influences of age of acquisition and native language. *Applied Psycholinguistics*, 21(3), 395-423.
- McDonald, J. L. (2006). Beyond the critical period: Processing-based explanations for poor grammaticality judgment performance by late second language learners. *Journal of Memory and Language*, 55(3), 381-401.
- Mare, M. (2014). *Demostrativos y posesivos posnominales en español* [Demonstratives and post-nominal possessives in Spanish]. *Sintagma: revista de lingüística*, 89-102.
- Marinis, T. (2016). Acquiring Possessives. In J. L. Lidz, W. Snyder, & J. Pater (eds.), *The Oxford Handbook of Developmental Linguistics*, 435-460.
- Marrero, V., & Aguirre, C. (2003). Plural acquisition and development in Spanish. In S. Montrul, & F. Ordóñez (eds.), *Linguistic Theory and Language Development in Hispanic Languages*, 275-296.
- Nicoladis, E., & Rhemtulla, M. (2012). Children's acquisition of word order depends on syntactic/semantic role: Evidence from adjective-noun order. *First Language*, 32(4), 479-493.
- Orozco, R. (2018). Spanish in Colombia and New York City: Language contact meets dialectal convergence. Amsterdam: John Benjamins.
- Östen, D. (2008). Definite articles in Scandinavian: competing grammaticalization processes in standard and non-standard varieties. In B. Kortmann (ed.), *Dialectology meets Typology: Dialect Grammar from a Cross-Linguistic Perspective*, 147-180.
- Payne, J., & Huddleston, R. (2002). Nouns and noun phrases. In R. Huddleston, & G. Pullum (eds.), *The Cambridge Grammar of the English Language*, 323-524.
- Perić, B., & Novak Mijić, S. N. (2017). Cross-Linguistic Influences in Third Language Acquisition (Spanish) and the Relationship between Language Proficiency and Types of Lexical Errors. *Croatian Journal of Education*, 19(2), 91-107.
- Peters, S., & Westerståhl, D. (2013). The semantics of possessives. *Language*, 89(4), 713-759.

- Picallo, M. C., & Rigau, G. (1999). *El posesivo y las relaciones posesivas* [The possessive and possessive relationships]. In I. Bosque & V. Demonte (eds.), *Gramática descriptiva de la lengua española*, 973-1023.
- Picoral, A., & Carvalho, A. M. (2020). The acquisition of preposition + article contractions in L3 Portuguese among different L1-speaking learners: A variationist approach. *Languages*, 5(3), 1-17.
- Platzack, C. (1987). The Scandinavian languages and the null-subject parameter. *Natural Language & Linguistic Theory*, 5(3), 377-401.
- Puig-Mayenco, E., & Marsden, H. (2018). Polarity-item *anything* in L3 English: Where does transfer come from when the L1 is Catalan and the L2 is Spanish?. *Second Language Research*, 34(4), 487-515.
- Pullum, G., & Huddleston, R. (2002). Adjectives and adverbs. In R. Huddleston, & G. Pullum (eds.), *The Cambridge Grammar of the English Language*, 525-596.
- Quesada, M. L. (2014). Subject Pronouns in Second Language Spanish. In K. L. Geeslin (ed.), *The Handbook of Spanish Second Language Acquisition*, 253-269.
- R Core Team. (2020). *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>
- Rodina, Y., & Westergaard, M. (2021). Grammatical Gender and Declension Class in Language Change: A Study of the Loss of Feminine Gender in Norwegian. *Journal of Germanic Linguistics*, 33(3), 235-263.
- Rosenkvist, H. (2009). Referential Null Subjects in Germanic Languages - an Overview. *Working Papers in Scandinavian Syntax*, 84, 151-180.
- Rothman, J. (2011). L3 syntactic transfer selectivity and typological determinacy: The Typological Primacy Model. *Second Language Research*, 27(1), 107-127.
- Rothman, J. (2013). Cognitive economy, non-redundancy and typological primacy in L3 acquisition: Evidence from initial stages of L3 Romance. In S. Baauw, F. Dirjkoningen, & M. Pinto (eds.), *Romance languages and linguistic theory*, 217-247.

Rothman, J. (2015). Linguistic and cognitive motivations for the Typological Primacy Model (TPM) of third language (L3) transfer: Timing of acquisition and proficiency considered. *Bilingualism*, 18(2), 179-190.

Rothman, J., & Cabrelli Amaro, J. (2009). What variables condition syntactic transfer? A look at the L3 initial state. *Second Language Research*, 25(4), 1-30.

Rothman, J., Judy, T., Guijarro-Fuentes, P., & Pires, A. (2010). On the (un)-ambiguity of Adjectival Interpretations in L2 Spanish: Informing debates on the mental representations of L2 syntax. *Studies in Second Language Acquisition*, 32(1), 47-77.

Rusk, B., Paradis, J., & Järvikivi, J. (2020). Comprehension of English plural-singular marking by Mandarin-L1, early L2-immersion learners. *Applied Psycholinguistics*, 41(3), 547-577.

Samad, A., & Arshad, N. (2017). The Sequence of Acquisition of Personal Pronoun Case and Person Reference among 6 Year Old Children in Two Selected Malaysian Kindergartens. *International Journal of Applied Linguistics & English Literature*, 6(3), 273-282.

Sanz, C. (2000). Bilingual education enhances third language acquisition: Evidence from Catalonia. *Applied Psycholinguistics*, 21, 23-44.

Schmid, M. (2011). Grammaticality judgment tasks. *Language attrition: key topics in sociolinguistics*. Cambridge University Press.

Schütze, C., & Sprouse, J. (2013). Judgment data. In R. J. Podesva, & D. Sharma (eds.), *Research Methods in Linguistics*, 27-50.

Schwartz, B., & Sprouse, R. (1996). L2 Cognitive States and the Full Transfer/Full Access Model. *Second Language Research*, 12(1), 40-72.

Sharwood Smith, M. (2021). Language transfer: A useful or pernicious concept?. *Second Language Research*, 37(3), 409-414.

Slabakova, R. (2008). *Meaning in the second language*. Berlin: Mouton de Gruyter.

Slabakova, R. (2013). What is easy and what is hard to acquire in a second language: a generative perspective. In M. García Mayo, M. J. Gutiérrez Mangado, & M. Martínez-Adrián, (eds.), *Contemporary approaches to second language acquisition*, 5-28.

Slabakova, R. (2016). *Second Language Acquisition*. Oxford: Oxford University Press.

Svenonius, P. (2002). Subjects, Expletives, and the EPP. In *Subjects, Expletives, and the EPP*. Oxford University Press.

Tavakol, M., & Jabbari, A. (2014). Cross-linguistic influence in third Language (L3) and fourth Language (L4) acquisition of the syntactic licensing of subject pronouns and object verb property: A case study. *International Journal of Research Studies in Language Learning*, 3(7), 29-42.

Valian, V. (2016). Null Subjects. In J. L. Lidz, W. Snyder, & J. Pater (eds.), *The Oxford Handbook of Developmental Linguistics*, 386-413.

Valois, D. (2006). Adjectives: Order within DP and Attributive APs. In M. Everaert, & H. van Riemsdijk (eds.), *The Blackwell Companion to Syntax, Volume I*, 61-82.

Van de Velde, F., Sleeman, P., & Perridon, H. (2014). The adjective in Germanic and Romance: Development, differences and similarities. In P. Sleeman, F. Van de Velde, & H. Perridon (eds.), *Adjectives in Germanic and Romance*, 1-32.

Van Peteghem, M. (2012). Possessives and grammaticalization in Romance. *Folia Linguistica*, 46(2), 605-634.

Vásquez Carranza, L. M. (2010). Cross-linguistic influence evidenced in possessive constructions: a study with an English-Spanish simultaneous bilingual child. *Revista Káñina*, 34(1), 147-167.

Wang, T. (2013). Cross-linguistic Influence in Third Language Acquisition: Factors Influencing Interlanguage Transfer. *Working Papers in TESOL & Applied Linguistics*, 13(2), 99-114.

Westergaard, M., Mitrofanova, N., Mykhaylyk, R., & Rodina, Y. (2017). Crosslinguistic influence in the acquisition of a third language: The Linguistic Proximity Model. *International Journal of Bilingualism*, 21(6), 666-682.

Westergaard, M., Mitrofanova, N., Rodina, Y., & Slabakova, R. Forthcoming. Full Transfer Potential in L3/Ln acquisition: Crosslinguistic influence as a property-by-property process. *The Cambridge Handbook of Third Language Acquisition and Processing*.

Wiltschko, M. (2008). The syntax of non-inflectional plural marking. *Natural Language & Linguistic Theory*, 26(3), 639-694.

Appendices

Appendix 1: Background questionnaire

This appendix section contains all questions included in the main experiment's background questionnaire. An English version of the questionnaire was provided to all groups except for the L1 SPA – L2 NOR, to whom the questionnaire was translated to Spanish (here displayed in italic brackets). Native Norwegian participants' background questionnaire consisted of questions 1-3 plus a fourth question on whether Norwegian was both their native and only first language.

1. What is your gender? (*¿Cuál es tu género?*)
 Feminine (*Femenino*) Masculine (*Masculino*) Other (*Otro*)
2. What is your age? (*¿Cuál es tu edad?*) _____
3. What is your highest educational level? (*¿Cuál es tu nivel de instrucción más alto?*)

<input type="checkbox"/> Bachelor not completed (<i>Licenciatura incompleta</i>)	<input type="checkbox"/> Bachelor completed (<i>Licenciatura completa</i>)
<input type="checkbox"/> Master not completed (<i>Máster incompleto</i>)	<input type="checkbox"/> Master completed (<i>Máster completo</i>)
<input type="checkbox"/> PhD not completed (<i>Doctorado incompleto</i>)	<input type="checkbox"/> PhD completed (<i>Doctorado completo</i>)
4. What is your native language? (*¿Cuál es tu idioma nativo?*)
 English (*Inglés*) Spanish (*Español*) Norwegian (*Noruego*)
5. What is your second language? (*¿Cuál es tu segundo idioma?*)
 English (*Inglés*) Spanish (*Español*) Norwegian (*Noruego*) Other (*Otro*)
6. Do you have knowledge of any other language(s)? (*¿Tienes conocimiento de algún otro idioma?*)
 Yes (*Sí*) No (*No*)
 - 6.1 Which one(s)? What is your level of proficiency? (*Cuál(es)? ¿Cuál es tu nivel?*)
7. What is your English proficiency level? (*¿Cuál es tu nivel de inglés?*)
 None A1 A2 B1 B2 C1 C2 Native
(*Ninguno*) (Nativo)

Appendix 2: Grammaticality judgment task (GJT) items

The following tables contain all the items presented in the main experiment's GJT. The experimental items are displayed in the 'Grammatical' and 'Ungrammatical' columns, and a translation to English and Spanish is provided. The sentences are here divided by linguistic property for better visualization.

Property 1: Nominal possessives gender agreement

Grammatical	English translation	Spanish translation	Ungrammatical
Denne festen er min.	This party is mine.	Esta fiesta es mía.	Denne festen er mitt.
Denne sekken er din.	This backpack is yours.	Esta mochila es tuya.	Denne sekken er ditt.
Denne maten er min.	This food is mine.	Esta comida es mía.	Denne maten er mitt.
Denne sykkelen er din.	This bicycle is yours.	Esta bicicleta es tuya.	Denne sykkelen er ditt.
Dette rommet er ditt.	This room is yours.	Esta habitación es tuya.	Dette rommet er din.
Dette huset er mitt.	This house is mine.	Esta casa es mía.	Dette huset er min.
Dette bildet er ditt.	This picture is yours.	Esta imagen es tuya.	Dette bildet er din.
Dette kortet er mitt.	This card is mine.	Esta tarjeta es mía.	Dette kortet er min.

Property 2: Determiner number concord

Grammatical	English translation	Spanish translation	Ungrammatical
De nye professorene er på kafeen.	The new professors are at the cafe.	Los nuevos profesores están en el café.	Den nye professorene er på kafeen.
De dårlige studentene er i parken.	The bad students are in the park.	Los malos estudiantes están en el parque.	Den dårlige studentene er i parken.
De flinke politikerne er i gangen.	The good politicians are in the hallway.	Los buenos políticos están en el pasillo.	Den flinke politikerne er i gangen.
De gamle arbeiderne er i hagen.	The old workers are in the garden.	Los viejos trabajadores están en el jardín.	Den gamle arbeiderne er i hagen.
De deilige bollene er i ovnen.	The delicious buns are in the oven.	Los deliciosos bollos están en el horno.	Den deilige bollene er i ovnen.
De gode produktene er i restauranten.	The good products are in the restaurant.	Los buenos productos están en el restaurante.	Den gode produktene er i restauranten.
De nye stolene er på balkongen.	The new chairs are on the balcony.	Las nuevas sillas están en el balcón.	Den nye stolene er på balkongen.
De fantastiske presentasjonene er i e-posten.	The fantastic presentations are in the email.	Las fantásticas presentaciones están en el correo electrónico.	Den fantastiske presentasjonene er i e-posten.

Property 3: Adjective placement

Grammatical	English translation	Spanish translation	Ungrammatical
Jeg kjører en rød bil.	I drive a red car.	Yo conduzco un coche rojo.	Jeg kjører en bil rød.
Du har en svart hatt.	You have a black hat.	Tú tienes un sombrero negro.	Du har en hatt svart.
Dere bruker en hvit telefon.	You use a white phone.	Ustedes usan un teléfono blanco.	Dere bruker en telefon hvit.
Vi har en gul sofa.	We have a yellow sofa.	Nosotros tenemos un sofá amarillo.	Vi har en sofa gul.
Han leser en fransk artikkel.	He reads a French article.	Él lee un artículo francés.	Han leser en artikkel fransk.
Hun har en norsk genser.	She has a Norwegian sweater.	Ella tiene un suéter noruego.	Hun har en genser norsk.
Vi jobber i en amerikansk bar.	We work in an American bar.	Nosotros trabajamos en un bar americano.	Hun jobber i en bar amerikansk.
Jeg kjenner en engelsk mann.	I know an English man.	Yo conozco a un hombre inglés.	Jeg kjenner en mann engelsk.

Property 4: Subject pronoun expression

Grammatical	English translation	Spanish translation	Ungrammatical
Det regner mye i Norge.	It rains a lot in Norway.	Llueve mucho en Noruega.	Regner mye i Norge.
Det snør mye om vinteren.	It snows a lot in the winter.	Nieva mucho en el invierno.	Snør mye om vinteren.
Det er veldig kaldt i Finland.	It is very cold in Finland.	Hace mucho frio en Finlandia.	Er veldig kaldt i Finland.
Det er veldig varmt i Brasil.	It is very hot in Brazil.	Hace mucho calor en Brasil.	Er veldig varmt i Brasil.
Faren sier at han er tørst.	The father says that he is thirsty.	El padre dice que tiene sed.	Faren sier at er tørst.
Gutten tror at han er smart.	The boy believes that he is smart.	El chico piensa que es inteligente.	Gutten tror at er smart.
Mannen sier at han er sulten.	The man says that he is hungry.	El hombre dice que tiene hambre.	Mannen sier at er sulten.
Han tror at han er snill.	He believes that he is kind.	Él piensa que es amable.	Han tror at er snill.

FILLER ITEMS

Fillers 1: Word-order

Grammatical	English translation	Spanish translation	Ungrammatical
Han spiser brød.	He eats bread.	Él come pan.	Han brød spiser.
Hun er lege.	She is a doctor.	Ella es doctora.	Hun lege er.
Gutten drikker vann.	The boy drinks water.	El niño bebe agua.	Gutten vann drikker.
Du bor i Oslo.	You live in Oslo.	Tu habitas en Oslo.	Du i Oslo bor.
Dere studerer biologi.	You study biology.	Ustedes estudian biologia.	Dere biologi studerer.
Vi snakker russisk.	We speak Russian.	Hablamos ruso.	Vi russisk snakker.
Hun trenger hjelp.	She needs help.	Ella necesita ayuda.	Hun hjelp trenger.
Jeg spiller basketball.	I play basketball.	Juego basketball.	Jeg basketball spiller.

Fillers 2: Quantifier-noun agreement

Grammatical	English translation	Spanish translation	Ungrammatical
Mannen reiser fem ganger i året.	The man travels five times a year.	El hombre viaja cinco veces al año.	Mannen reiser fem gang i året.
Jeg drikker åtte kopper kaffe om dagen.	I drink eight cups of coffee a day.	Bebo ocho tazas de café al día.	Jeg drikker åtte kopp kaffe om dagen.
Vi leser ni bøker i måneden.	We read nine books a month.	Leemos nueve libros al mes.	Vi leser ni bok i måneden.
Han sover tolv timer hver natt.	He sleeps twelve hours every night.	Él duerme doce horas todas las noches.	Han sover tolv time hver natt.
Dere ser på tre filmer hver søndag.	You watch three movies every Sunday.	Ustedes ven tres películas todos los domingos.	Dere ser på tre film hver søndag.
Du har seks eksamener i måneden.	You have six exams a month.	Tienes seis exámenes al mes.	Du har seks eksamen i måneden.
Hun jobber på fire restauranter hver helg.	She works at four restaurants every weekend.	Ella trabaja en cuatro restaurantes todos los fines de semana.	Hun jobber på fire restaurant hver helg.
Læreren holder to presentasjoner hver uke.	The teacher holds two presentations every week.	El profesor realiza dos presentaciones toda semana.	Læreren holder to presentasjon hver uke.

Appendix 3: Closed-ended questionnaire

Task items

1. How difficult do you think it is to learn Norwegian?

Very difficult _____ Very easy

2. How difficult is it for you to learn the Norwegian gender agreement between nouns and possessives (ex. whether it is 'bilen mi', 'bilen min' or 'bilen mitt')?

Very difficult _____ Very easy

3. How similar/different is the Norwegian gender agreement between nouns and possessives to the one in Spanish?

Very different _____ Very similar

4. How similar/different is the Norwegian gender agreement between nouns and possessives to the one in English?

Very different _____ Very similar

5. How difficult is it for you to learn the Norwegian number concord on determiners (ex. whether it is 'de svarte bilene' or 'den svarte bilene')?

Very difficult _____ Very easy

6. How similar/different is the Norwegian number concord on determiners to the one in Spanish?

Very different _____ Very similar

7. How similar/different is the Norwegian number concord on determiners to the one in English?

Very different _____ Very similar

8. How difficult is it for you to learn the Norwegian adjective placement (ex. whether it is 'en norsk butikk' or 'en butikk norsk')?

Very difficult _____ Very easy

9. How similar/different is the Norwegian adjective placement to the one in Spanish?

Very different _____ Very similar

10. How similar/different is the Norwegian adjective placement to the one in English?

Very different _____ Very similar

11. How difficult is it for you to learn the Norwegian subject pronoun expression (ex. whether it is 'det regner i dag' or 'regner i dag')?

Very difficult _____ Very easy

12. How similar/different is the Norwegian subject pronoun expression to the one in Spanish?

Very different _____ Very similar

13. How similar/different is the Norwegian subject pronoun expression to the one in English?

Very different _____ Very similar

14. Do you think knowing English helps you learning Norwegian?

Strongly disagree _____ Strongly agree

15. Do you think knowing Spanish helps you learning Norwegian?

Strongly disagree _____ Strongly agree

16. How similar do you think the English and the Norwegian languages are?

Very different _____ Very similar

17. How similar do you think the Spanish and the Norwegian languages are?

Very different _____ Very similar

18. How similar do you think the English and the Spanish languages are?

Very different _____ Very similar

Appendix 4: Proficiency tests

A. Norwegian proficiency test

The following list contains all the items of the Norwegian proficiency test employed in the present study. Participants were instructed to choose one of the four options presented in order to best answer the questions or fill in the gaps. The items appeared in the exact same order as the list provided below.

Task items

1) Hva heter du?

- (a) Jeg heter Maria. (b) Du heter Maria. (c) Norsk. (d) Ikke så ofte.

2) Hvor bor dere?

- (a) Dere kommer fra Italia. (b) Vi bor i Tromsø. (c) Dere bor i Tromsø. (d) Lingvistikk.

3) Hvordan har du det?

- (a) Ikke så ofte. (b) Ikke så bra. (c) Jeg har bil. (d) Du er dårlig.

4) Kan hun fransk?

- (a) Nei, ikke så mye. (b) Bare bra. (c) Ja, hun har det bra. (d) Ja, hun elsker fransk mat.

5) Hvem snakker du med?

- (a) Med buss. (b) I telefonen. (c) En venn. (d) Hver dag.

6) Han liker _____

- (a) du. (b) de. (c) dem. (d) hun.

7) Jeg liker ikke _____

- (a) å kjøre bil. (b) kjører. (c) å lage. (d) lager mat.

8) Kan du _____ ?

- (a) sykle (b) å sykle (c) sykler (d) en sykkel

9) Hva _____ du gjøre i kveld?

- (a) mat (b) etterpå (c) liker (d) skal

10) Kan jeg _____ litt kaffe?

- (a) ha (b) få (c) lyst på (d) drikker

11) Hvor mye koster det?

- (a) For mange. (b) Jeg er ikke sikker. (c) Ja, gjerne. (d) Vær så god!

12) Vi trenger mange _____

- (a) bord. (b) bordene. (c) et bord. (d) bordet.

13) Kan du _____ meg?

- (a) ta med litt (b) vente på (c) bestille (d) sikker på

14) Hvorfor drar du nå?

- (a) Til byen. (b) Nei, i morgen. (c) Veldig sent. (d) Fordi jeg må hjem.

15) Hvor skal du?

- (a) På jobb. (b) Hjemme. (c) I Nepal. (d) Ja, det skal jeg.

16) Filmen er _____ spennende.

- (a) ferdig (b) mye (c) veldig (d) hele

17) _____ gammel er han?

- (a) Hva (b) Hvordan (c) Hvilken (d) Hvor

18) Hva _____ henne?

- (a) tenker du på (b) synes du om (c) liker du (d) gjør

19) Skal dere invitere?

- (a) mer (b) ikke annet (c) noen andre (d) gjerne

20) Jeg vet ikke _____ jeg har tid.

- (a) om (b) ennå (c) alt (d) eller

21) Nå _____

- (a) vi må dra. (b) er jeg ferdig. (c) ofte jeg sykler. (d) er på besøk.

22) _____ er mange studenter her.

- (a) Disse (b) Dem (c) Den (d) Det

23) Klokka er fem _____ to.

- (a) etter (b) over (c) snart (d) til

24) Han _____ ganske tidlig.

- (a) står opp (b) klokka (c) pleier (d) vanligvis

25) Når skal du til Oslo?

- (a) For to dager (b) I to dager. (c) Om to dager. (d) På to dager.

26) Hvor skal vi _____ sofaen?

- (a) sette (b) ligge (c) stå (d) sitte

27) Hun sitter _____ Per og Olav.

- (a) heller (b) mellom (c) også (d) til

28) De skal spise middag _____ Peter.

- (a) til (b) av (c) hos (d) på

29) Hun har en bror _____ studerer tysk.

- (a) vil (b) hvem (c) at (d) som

30) Kjenner du søstera_____?

- (a) hans (b) henne (c) til hun (d) av ham

31) Jeg_____ melk.

- (a) aldri drikker (b) heller vil ha (c) kjøper ofte (d) kanskje skal få

32) Jeg er her_____ lære norsk.

- (a) og (b) å (c) for å (d) fordi

33) Jeg ser etter en_____ dress.

- (a) mørk (b) mørkt (c) mørke (d) mørkest

34) Vil du... disse skoene?

- (a) smake (b) lese (c) kjøre (d) prøve

35) Er du klar til å dra snart?

- (a) Ja, jeg må bare pusse tennene. (b) Ja, jeg må dele bad. (c) Nei, jeg er ledig.
(d) Ja, jeg blir snart sint.

36) Kjøkkenet er alltid opptatt_____

- (a) i morgen. (b) om ettermiddagen. (c) bare i kveld. (d) i går.

37) Ha føler_____bedre i dag.

- (a) seg (b) ham (c) hans (d) han

38) Hun lærer_____

- (a) sant. (b) raskt. (c) mange. (d) fin.

39) Når møtte du henne sist?

- (a) For to dager siden. (b) Om to år. (c) I fem uker. (d) Siden fredag.

40) Er du fremdeles syk?

- (a) Nei, ikke sant. (b) Nei, jeg føler meg dårlig. (c) Ja, jeg kjenner en doktor.
(d) Ja, jeg må bastille time hos legen.

Score

Level

1 - 23

Beginner (A1)

24 - 31

Elementary (A2)

32 - 40

Pre-intermediate (B1)

Note: As previously stated in section 5.2.4, the Norwegian proficiency test was based on an adaptation of the Arctic University of Norway (UiT) placement test for the Norwegian courses for international students (test for levels A2 and B1). The score-level scale was adapted for the present study number of items following the original score percentage of the test, in which a

60% and 80% target-like performance placed participants in the A2 and B1 levels, respectively.

The original and complete test can be freely accessed in the university's website:

<https://fr.uit.no/ressurs/uit/norskurs/Plasseringstest.htm>

B. The Standardized Oxford Proficiency test

The following list contains all the items of the English proficiency test employed in the present study. Participants were instructed the test consisted of two distinct parts. In part 1, they were expected to choose one of the three options presented in order to best fill in the gaps. In part 2, they were expected to fill in the gaps in a coherent manner in order to maintain the logical flow of the narration. The items appeared in the exact same order as the list provided below.

Task items

Part 1 (English grammar)

1) Water _____ at a temperature of 100° C.

- (a) is to boil (b) is boiling (c) boils

2) In some countries _____ very hot all the time.

- (a) there is (b) is (c) it is

3) In cold countries people wear thick clothes _____ warm.

- (a) for keeping (b) to keep (c) for to keep

4) In England people are always talking about _____.

- (a) a weather (b) the weather (c) weather

5) In some places _____ almost every day.

- (a) it rains (b) there rains (c) it raining

6) In deserts, there isn't _____ grass.

- (a) the (b) some (c) any

7) Places near the Equator have _____ weather even in the cold season.

- (a) a warm (b) warm (c) the warm

8) In England _____ time of year is usually from December to February.

- (a) coldest (b) the coldest (c) colder

9) _____ people don't know what it's like in other countries.

- (a) The most (b) Most of (c) Most

10) Very _____ people can travel abroad.

- (a) less (b) little (c) few

11) Mohammed Ali _____ his first world title fight in 1960.

- (a) has won (b) won (c) is winning

- 12) After he _____ an Olympic gold medal, he became a professional boxer.
 (a) had won (b) have won (c) was winning
- 13) His religious beliefs _____ change his name when he became a champion.
 (a) have made him (b) made him to (c) made him
- 14) If he _____ lost his first fight with Sonny Liston, no one would have been surprised.
 (a) has (b) would have (c) had
- 15) He has traveled a lot _____ as a boxer and as a world-famous personality.
 (a) both (b) and (c) or
- 16) He is very well known _____ the world.
 (a) all in (b) all over (c) in all
- 17) Many people _____ he was the greatest boxer of all time.
 (a) is believing (b) are believing (c) believe
- 18) To be the best _____ the world is not easy.
 (a) from (b) in (c) of
- 19) Like any top sportsman, Ali _____ train very hard.
 (a) had to (b) must (c) should
- 20) Even though he has now lost his title, people _____ always remember him as a champion.
 (a) would (b) will (c) did

Part 2 (continuous narrative)

- 21) The history of _____ is
 (a) airplane (b) the airplane (c) an airplane
- 22) _____ short one. For many centuries men
 (a) quite a (b) a quite (c) quite
- 23) _____ to fly, but with
 (a) are trying (b) try (c) had tried
- 24) _____ success. In the 19th century a few people
 (a) little (b) few (c) a little
- 25) succeeded _____ in balloons. But it wasn't until
 (a) to fly (b) in flying (c) into flying
- 26) the beginning of _____ century that anybody
 (a) last (b) next (c) that

- 27) _____ able to fly in a machine
 (a) were (b) is (c) was
- 28) _____ was heavier than air, in other words, in
 (a) who (b) which (c) what
- 29) _____ we now call a 'plane'. The first people to achieve
 (a) who (b) which (c) what
- 30) 'powered flight' were the Wright brothers. _____ was the machine
 (a) His (b) Their (c) Theirs
- 31) which was the forerunner of the Jumbo jets and supersonic airliners that are
 _____ common
 (a) such (b) such a (c) some
- 32) sight today. They _____ hardly have imagined that in 1969,
 (a) could (b) should (c) couldn't
- 33) _____ more than half a century later,
 (a) not much (b) not many (c) no much
- 34) a man _____ landed on the moon.
 (a) will be (b) had been (c) would have
- 35) Already _____ is taking the first steps towards the stars.
 (a) a man (b) man (c) the man
- 36) Although space satellites have existed _____ less
 (a) since (b) during (c) for
- 37) than forty years, we are now dependent _____ them for all
 (a) from (b) of (c) on
- 38) kinds of _____. Not only
 (a) informations (b) information (c) an information
- 39) _____ being used for scientific research in
 (a) are they (b) they are (c) there are
- 40) space, but also to see what kind of weather _____.
 (a) is coming (b) comes (c) coming

Score	Level	Score	Level
1 - 8	Beginner (A1)	25 - 32	Intermediate (B2)
9 - 16	Elementary (A2)	33 - 40	Advanced (C1)
17 - 24	Pre-intermediate (B1)		

Appendix 5: Participants background information

N°	Gender	Age	Education	*1	*2	*3	*4	*5	*6
Target group – L1 SPA – L2 ENG – L3 NOR									
1	Feminine	39	Master completed	A2	27	9	13	C1	36
2	Feminine	34	Bachelor completed	B1	37	9	16	B2	32
3	Feminine	27	Bachelor completed	A1	13	3	4	C1	34
4	Feminine	27	Bachelor completed	A1	21	2	36	C1	39
5	Feminine	26	Master completed	B1	37	6	24	C1	38
6	Feminine	30	Master completed	B1	38	4	36	C1	39
7	Feminine	37	Master not completed	B1	35	35	12	C1	37
8	Masculine	30	PhD not completed	B1	33	12	48	C1	35
9	Feminine	25	Master not completed	A1	22	1	8	C1	34
10	Masculine	33	Master not completed	A2	31	12	24	C1	37
11	Feminine	24	Bachelor completed	A2	29	2	12	B2	30
12	Masculine	26	Master not completed	A2	29	2	7	C1	39
13	Feminine	25	Bachelor completed	B1	35	7	7	B1	22
14	Feminine	48	Master not completed	A2	24	24	24	B2	29
15	Masculine	26	Master not completed	B1	31	12	12	C1	34
16	Feminine	29	Master not completed	B1	37	5	1	C1	37
17	Feminine	43	PhD completed	A1	19	36	36	C1	35
18	Feminine	19	Bachelor completed	B1	33	24	24	B1	20
Control group 1 – L1 SPA – L2 NOR									
19	Feminine	56	Bachelor completed	B1	38	36	36	None	N/A
20	Feminine	23	Bachelor not completed	A2	28	7	12	None	N/A
21	Feminine	37	Bachelor not completed	A1	22	24	38	None	N/A
22	Feminine	39	Bachelor completed	B1	37	2	3	None	N/A
23	Feminine	31	Bachelor completed	A1	12	2	2	None	N/A
Control group 2 – L1 ENG – L2 NOR									
24	Feminine	27	Bachelor completed	A1	22	3	8	Native	N/A
25	Feminine	45	Master completed	A1	18	3	24	Native	N/A
26	Feminine	26	Master not completed	A2	24	24	12	Native	N/A
27	Feminine	25	Master not completed	A2	24	12	12	Native	N/A
28	Feminine	27	Master not completed	A2	26	8	10	Native	N/A
29	Feminine	25	Bachelor not completed	B1	35	42	42	Native	N/A
30	Feminine	22	Bachelor not completed	B1	35	6	18	Native	N/A
31	Feminine	25	PhD not completed	B1	35	12	12	Native	N/A
32	Masculine	56	Master completed	A1	22	1	2	Native	N/A
33	Masculine	23	Master not completed	A1	18	6	6	Native	N/A
34	Masculine	47	Bachelor not completed	A2	28	6	24	Native	N/A
35	Masculine	24	Master not completed	A2	26	12	12	Native	N/A
36	Masculine	27	PhD not completed	B1	33	33	24	Native	N/A

Note

*1 = Norwegian Proficiency level (CEFR) following the proficiency test

*2 = Score obtained in the Norwegian Proficiency Test (/50)

*3 = Number of months studying Norwegian

*4 = Number of months living in Norway (Norwegian language immersion)

*5 = English proficiency level (following the proficiency test for L1 SPA – L2 ENG – L3 NOR participants)

*6 = Score obtained in Standardized Oxford Proficiency Test (/50)

Native control group – L1 NOR			
Participant	Gender	Age	Education
37	Feminine	22	Bachelor not completed
38	Masculine	22	Bachelor not completed
39	Masculine	21	Bachelor not completed
40	Feminine	30	Master completed
41	Feminine	22	Bachelor not completed
42	Feminine	22	Bachelor not completed
43	Masculine	26	Bachelor not completed
44	Masculine	21	Master not completed
45	Masculine	31	Master completed
46	Feminine	23	Master not completed
47	Feminine	31	Master completed
48	Feminine	21	Bachelor not completed
49	Masculine	27	Master not completed
50	Masculine	22	Bachelor not completed
51	Feminine	21	Bachelor not completed

Appendix 6: Statistics on background data

A. Interaction between gender and accuracy: Not significant

Logistic regression

Family: binomial (logit)

Formula: Accuracy ~ Gender + (1 |ID)+ (1 |Item)

	Estimate	Std. Error	z value	p-value
(Intercept)	1.64620	0.24620	6.686	2.29e-11 ***
Gender.Masculine	-0.07319	0.46285	-0.158	0.874

B. Correlation between age and accuracy: No significant correlation

Kendall's rank correlation tau

Data: Correlation\$Age and Correlation\$Accuracy

$z = -0.5073$, p-value = 0.6119

Sample estimates: tau = -0.06116112

C. Interaction between highest level of education and accuracy: Not significant

Logistic regression

Family: binomial (logit)

Formula: Accuracy ~ Education + (1 |ID)+ (1 |Item)

	Estimate	Std. Error	z value	p-value
(Intercept)	1.39186	0.37113	3.750	0.000177 ***
Education.bachelor.not.completed	0.74021	0.63677	1.162	0.2450
Education.master.completed	0.00261	0.63061	0.004	0.9966
Education.master.not.completed	0.23132	0.49372	0.469	0.6394
Education.PhD.completed	-0.53177	1.18343	-0.449	0.6531
Education.PhD.not.completed	0.79326	0.76226	1.041	0.2980

D. Correlation between length of Norwegian study and accuracy: No significant correlation

Kendall's rank correlation tau

Data: Correlation\$Norwegian_study_months and Correlation\$Accuracy

$z = 0.54955$, p-value = 0.5826

Sample estimates: tau = 0.0667937

E. Correlation between length of residence in Norway and accuracy: No significant correlation

Kendall's rank correlation tau

Data: Correlation\$Residence_months and Correlation\$Accuracy

$z = -0.84212$, p-value = 0.3997

Sample estimates: tau = -0.1030994

F. Correlation between length of Norwegian study and Norwegian proficiency level (test based): No significant correlation

Kendall's rank correlation tau

Data: Correlation2\$Norwegian_study_months and Correlation2\$Norwegian_level

$z = 1.2672$, p-value = 0.2051

Sample estimates: tau = 0.1871287

G. Correlation between length of residence in Norway and Norwegian proficiency level (test based): No significant correlation

Kendall's rank correlation tau

Data: Correlation2\$Residence_months and Correlation2\$Norwegian_level

$z = -1.5892$, p-value = 0.112

Sample estimates: tau = -0.2373807

Appendix 7: Statistics on Norwegian proficiency test data

A. Comparability of linguistic groups in terms of Norwegian proficiency: Groups are comparable across this factor

One-way ANOVA

Analysis of variance table

Response: Norwegian_proficiency

	Df	Sum Sq	Mean Sq	F-value	<i>p</i> -value
Group	2	33.23	16.613	0.8318	0.4442
Residuals	33	659.08	19.972		

B. Follow-up test: Bartlett test of homogeneity of variances

Data: Norwegian_proficiency by group

Bartlett's K-Squared = 1.4302, df = 2, *p*-value = 0.4891

Appendix 8: Statistics on the grammaticality judgement task (non-natives)

A. Model for accuracy predicted by Group and Condition.

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation)

[‘glmerMod’]

Family: binomial (logit)

Formula: accuracy~group*condition + Norwegian_level + English_level + (1 |ID) + (1 |item)

Predictors	Estimate	Std. Error	z value	p-value
(Intercept)	0.41106	1.11087	0.370	0.711354
Group.SCG	0.66001	1.14574	0.576	0.564578
Group.STG	-0.04534	0.88249	-0.051	0.959023
Condition.NUM	-1.59742	0.29386	-5.436	5.45e-08 ***
Condition.POSS	-1.44424	0.29469	-4.901	9.54e-07 ***
Condition.SPE	0.20578	0.33832	0.608	0.543032
Norwegian.level.A2	0.36287	0.37243	0.974	0.329903
Norwegian.level.B1	1.98462	0.36038	5.507	3.65e-08 ***
English.level.B2	0.39998	0.79592	0.503	0.615289
English.level.C1	0.80173	0.65269	1.228	0.219314
Group.SCG: Condition.NUM	0.21350	0.48828	0.437	0.661930
Group.STG: Condition.NUM	0.62471	0.35041	1.783	0.074622 .
Group.SCG: Condition.POSS	1.76580	0.53529	3.299	0.000971 ***
Group.STG: Condition.POSS	1.44438	0.36214	3.988	6.65e-05 ***
Group.SCG: Condition.SPE	-0.96276	0.52175	-1.845	0.065001 .
Group.STG: Condition.SPE	-0.58385	0.39304	-1.485	0.137416

B. Post-hoc pairwise comparisons of groups within conditions (with adjusted alpha levels).

\$emmeans					
Group	emmean	SE	df	asympt.LCL	asympt.UCL
Condition = ADJ					
ECG	0.908	0.0267	Inf	0.841	0.949
SCG	0.865	0.0559	Inf	0.715	0.942
STG	0.859	0.0326	Inf	0.782	0.912
Condition = NUM					
ECG	0.668	0.0618	Inf	0.538	0.776
SCG	0.615	0.1033	Inf	0.405	0.790
STG	0.697	0.0528	Inf	0.585	0.790
Condition = POSS					
ECG	0.700	0.0588	Inf	0.574	0.802
SCG	0.898	0.0456	Inf	0.769	0.959
STG	0.859	0.0326	Inf	0.783	0.912
Condition = SPE					
ECG	0.924	0.0233	Inf	0.864	0.959
SCG	0.750	0.0841	Inf	0.555	0.879
STG	0.807	0.0405	Inf	0.715	0.874

Confidence level used: 0.95.

\$Contrasts					
Contrasts	odds.ratio	SE	df	z.ratio	p-value
Condition = ADJ					
ECG / SCG	1.547	0.874	Inf	0.772	0.7201
ECG / STG	1.627	0.651	Inf	1.215	0.4440
SCG / STG	1.051	0.562	Inf	0.094	0.9952
Condition = NUM					
ECG / SCG	1.256	0.637	Inf	0.449	0.8950
ECG / STG	0.873	0.310	Inf	-0.383	0.9222
SCG / STG	0.695	0.340	Inf	-0.745	0.7366
Condition = POSS					
ECG / SCG	0.265	0.149	Inf	-2.365	0.0474
ECG / STG	0.384	0.142	Inf	-2.592	0.0259
SCG / STG	1.449	0.801	Inf	0.672	0.7800
Condition = SPE					
ECG / SCG	4.053	2.218	Inf	2.558	0.0284
ECG / STG	2.915	1.176	Inf	2.652	0.0218
SCG / STG	0.719	0.362	Inf	-0.654	0.7899

P-value adjustment: tukey method for comparing a family of 3 estimates.

C. Post-hoc pairwise comparisons of L3 Norwegian level within conditions (with adjusted alpha levels).

\$emmeans					
Group STG	emmean	SE	df	asymp.LCL	asymp.UCL
Group = STG, Condition = ADJ					
A1	0.844	0.058	Inf	0.694	0.928
A2	0.717	0.084	Inf	0.528	0.851
B1	0.940	0.022	Inf	0.878	0.971
Group = STG, Condition = NUM					
A1	0.633	0.096	Inf	0.434	0.795
A2	0.504	0.101	Inf	0.314	0.693
B1	0.842	0.044	Inf	0.734	0.911
Group = STG, Condition = POSS					
A1	0.689	0.089	Inf	0.495	0.834
A2	0.800	0.068	Inf	0.633	0.903
B1	0.982	0.009	Inf	0.949	0.994
Group = STG, Condition = SPE					
A1	0.633	0.096	Inf	0.435	0.795
A2	0.618	0.096	Inf	0.420	0.783
B1	0.966	0.014	Inf	0.921	0.985

Confidence level used: 0.95.

\$Contrasts					
Contrasts, Group = STG	odds.ratio	SE	df	z.ratio	p-value
Condition = ADJ					
A1 / A2	2.1357	1.2850	Inf	1.261	0.4172
A1 / B1	0.3477	0.2026	Inf	-1.813	0.1653
A2/ B1	0.1628	0.0920	Inf	-3.214	0.0037
Condition = NUM					
A1 / A2	1.6984	0.9749	Inf	0.923	0.6258
A1 / B1	0.3247	0.1702	Inf	-2.146	0.0018
A2/ B1	0.1912	0.0994	Inf	-3.181	0.0012
Condition = POSS					
A1 / A2	0.5539	0.3283	Inf	-0.997	0.5788
A1 / B1	0.0415	0.0279	Inf	-4.736	<.0001
A2/ B1	0.0750	0.0511	Inf	-3.804	0.0004
Condition = SPE					
A1 / A2	0.5539	0.3283	Inf	-0.997	0.5788
A1 / B1	0.0415	0.0279	Inf	-4.736	<.0001
A2/ B1	0.0750	0.0511	Inf	-3.804	<.0001

P-value adjustment: tukey method for comparing a family of 3 estimates.

D. Post-hoc pairwise comparisons of English level within conditions (with adjusted alpha levels).

\$emmeans					
English_level	emmean	SE	df	asympt.LCL	asympt.UCL
Group = STG, Condition = ADJ					
B1	0.869	0.1199	Inf	0.458	0.981
B2	0.717	0.1710	Inf	0.327	0.930
C1	0.929	0.0293	Inf	0.846	0.969
Group = STG, Condition = NUM					
B1	0.710	0.2066	Inf	0.255	0.946
B2	0.861	0.1030	Inf	0.534	0.971
C1	0.741	0.0789	Inf	0.561	0.865
Group = STG, Condition = POSS					
B1	0.951	0.0552	Inf	0.657	0.995
B2	0.826	0.1229	Inf	0.470	0.962
C1	0.900	0.0388	Inf	0.795	0.955
Group = STG, Condition = SPE					
B1	0.976	0.0322	Inf	0.736	0.998
B2	0.786	0.1429	Inf	0.410	0.951
C1	0.847	0.0547	Inf	0.708	0.926

Confidence level used: 0.95.

\$Contrasts					
Contrasts, Group = STG	odds.ratio	SE	df	z.ratio	p-value
Condition = ADJ					
B1 / B2	2.604	3.491	Inf	0.714	0.7552
B1 / C1	0.505	0.571	Inf	-0.604	0.8177
B2 / C1	0.194	0.182	Inf	-1.742	0.1895
Condition = NUM					
B1 / B2	0.395	0.520	Inf	-0.705	0.7604
B1 / C1	0.859	0.925	Inf	-0.141	0.9890
B2 / C1	2.174	2.053	Inf	0.822	0.6894
Condition = POSS					
B1 / B2	4.076	5.908	Inf	0.970	0.5962
B1 / C1	2.137	2.667	Inf	0.609	0.8154
B2 / C1	0.524	0.496	Inf	-0.683	0.7736
Condition = SPE					
B1 / B2	11.012	17.641	Inf	1.498	0.2920
B1 / C1	7.324	10.416	Inf	1.400	0.3408
B2 / C1	0.665	0.623	Inf	-0.436	0.9007

P-value adjustment: tukey method for comparing a family of 3 estimates.

E. Accuracy predicted by condition and item type.

Generalized linear mixed model fit by maximum likelihood (Laplace Approximation)

[‘glmerMod’]

Family: binomial (logit)

Formula: accuracy~ condition*item_type + group + (1 |ID) + (1 |item)

Predictors	Estimate	Std. Error	z value	p-value
(Intercept)	2.2946	0.3881	5.913	3.36e-09 ***
Condition.NUM	-1.5128	0.2647	-5.716	1.09e-08 ***
Condition.POSS	-0.6083	0.2759	-2.205	0.0274 *
Condition.SPE	-0.4718	0.2790	-1.691	0.0909 .
Item_type_wrong	-0.6095	0.2758	-2.209	0.0271 *
Group.SCG	0.0520	0.6313	0.082	0.9344
Group.STG	0.3106	0.4370	0.711	0.4773
Condition.NUM:Item_type_wrong	0.4939	0.3584	1.378	0.1681
Condition.POSS:Item_type_wrong	0.1131	0.3707	0.305	0.7603
Condition.SPE:Item_type_wrong	0.3681	0.3775	0.975	0.3296

Post-hoc pairwise comparisons of item type within conditions (with adjusted alpha levels).

\$emmeans					
Item type	emmean	SE	df	asymp.LCL	asymp.UCL
Condition = ADJ					
Right	0.918	0.0232	Inf	0.860	0.953
Wrong	0.859	0.0352	Inf	0.775	0.915
Condition = NUM					
Right	0.711	0.0569	Inf	0.589	0.809
Wrong	0.687	0.0593	Inf	0.561	0.791
Condition = POSS					
Right	0.859	0.0352	Inf	0.775	0.915
Wrong	0.788	0.0471	Inf	0.681	0.866
Condition = SPE					
Right	0.875	0.0322	Inf	0.797	0.925
Wrong	0.846	0.0376	Inf	0.757	0.906

Confidence level used: 0.95.

\$Contrasts					
Contrasts	odds.ratio	SE	df	z.ratio	<i>p</i> -value
Condition = ADJ					
Right / Wrong	1.84	0.507	Inf	2.209	0.0271
Condition = NUM					
Right / Wrong	1.12	0.257	Inf	0.505	0.6135
Condition = POSS					
Right / Wrong	1.64	0.407	Inf	2.002	0.0453
Condition = SPE					
Right / Wrong	1.27	0.328	Inf	0.936	0.3493

F. Post-hoc pairwise comparisons of item type within conditions and group (with adjusted alpha levels).

\$emmeans	emmean	SE	df	asymp.LCL	asymp.UCL
Item type					
Condition = ADJ, Group = ECG					
Right	0.954	0.0264	Inf	0.864	0.979
Wrong	0.864	0.0510	Inf	0.731	0.937
Condition = NUM, Group = ECG					
Right	0.644	0.0922	Inf	0.451	0.799
Wrong	0.687	0.0869	Inf	0.498	0.829
Condition = POSS, Group = ECG					
Right	0.730	0.0804	Inf	0.548	0.857
Wrong	0.665	0.0897	Inf	0.474	0.814
Condition = SPE, Group = ECG					
Right	0.923	0.0338	Inf	0.825	0.968
Wrong	0.922	0.0339	Inf	0.824	0.968
Condition = ADJ, Group = SCG					
Right	0.884	0.0717	Inf	0.659	0.968
Wrong	0.884	0.0717	Inf	0.659	0.968
Condition = NUM, Group = SCG					
Right	0.619	0.1528	Inf	0.313	0.852
Wrong	0.682	0.1412	Inf	0.374	0.885
Condition = POSS, Group = SCG					
Right	0.904	0.0621	Inf	0.698	0.975
Wrong	0.922	0.0528	Inf	0.737	0.981
Condition = SPE, Group = SCG					
Right	0.841	0.0904	Inf	0.584	0.952
Wrong	0.711	0.1340	Inf	0.407	0.899
Condition = ADJ, Group = STG					
Right	0.918	0.0299	Inf	0.837	0.960
Wrong	0.860	0.0448	Inf	0.748	0.927
Condition = NUM, Group = STG					
Right	0.800	0.0578	Inf	0.664	0.891
Wrong	0.708	0.0732	Inf	0.547	0.829
Condition = POSS, Group = STG					
Right	0.933	0.0256	Inf	0.862	0.969
Wrong	0.842	0.0491	Inf	0.721	0.916
Condition = SPE, Group = STG					
Right	0.861	0.0447	Inf	0.749	0.928
Wrong	0.835	0.0506	Inf	0.711	0.912

Confidence level used: 0.95.

\$Contrasts					
Contrasts	odds.ratio	SE	df	z.ratio	<i>p</i> -value
Condition = ADJ, Group = ECG					
Right / Wrong	2.684	1.289	Inf	2.056	0.0398
Condition = NUM, Group = ECG					
Right / Wrong	0.823	0.279	Inf	-0.576	0.5649
Condition = POSS, Group = ECG					
Right / Wrong	1.359	0.467	Inf	0.893	0.3716
Condition = SPE, Group = ECG					
Right / Wrong	1.008	0.486	Inf	0.017	0.9868
Condition = ADJ, Group = SCG					
Right / Wrong	0.999	0.638	Inf	-0.001	0.988
Condition = NUM, Group = SCG					
Right / Wrong	0.758	0.409	Inf	-0.514	0.6070
Condition = POSS, Group = SCG					
Right / Wrong	0.791	0.550	Inf	-0.337	0.7363
Condition = SPE, Group = SCG					
Right / Wrong	2.154	1.230	Inf	1.344	0.1789
Condition = ADJ, Group = STG					
Right / Wrong	1.810	0.666	Inf	1.614	0.1064
Condition = NUM, Group = STG					
Right / Wrong	1.656	0.526	Inf	1.590	0.118
Condition = POSS, Group = STG					
Right / Wrong	2.609	0.983	Inf	2.544	0.0110
Condition = SPE, Group = STG					
Right / Wrong	1.224	0.415	Inf	0.597	0.5507