Master's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Humanities
Department of Language and Literature

Agoritsa Vangelokosta

The acquisition of grammatical gender in Greek-Norwegian bilingual children

Master's thesis in English Linguistics and Language Acquisition
Supervisor: Yvonne van Baal
Co-supervisor: Terje Lohndal
November 2022

NTNU
Norwegian University of
Science and Technology

Agoritsa Vangelokosta

The acquisition of grammatical gender in Greek-Norwegian bilingual children

Master's thesis in English Linguistics and Language Acquisition
Supervisor: Yvonne van Baal
Co-supervisor: Terje Lohndal
November 2022

Norwegian University of Science and Technology
Faculty of Humanities
Department of Language and Literature

NTNU
Norwegian University of
Science and Technology

Abstract

This thesis investigates the acquisition of grammatical gender in Greek and Norwegian by Greek-Norwegian bilingual children. Both Greek and Norwegian encode grammatical gender in noun phrases. However, the two languages differ fundamentally with respect to the gender cues available to children and the acquisitional patterns observed in monolinguals. Greek offers frequent and consistent morphological cues that lead to a short gender acquisition process in Greek monolinguals (Mastropavlou, 2006). Norwegian morphological gender cues are infrequent and unreliable which is responsible for the slow gender acquisition process in Norwegian monolinguals (Busterud et al., 2019; Rodina & Westergaard, 2015a).

In this thesis, I identify the acquisitional patterns and the gender defaults in both Greek and Norwegian and I examine the children's sensitivity to morphophonological gender cues in each language. I also investigate the role that cross-linguistic influence, transparency, home language(s), age, literacy, Greek schooling, and birth order have in bilingual Greek-Norwegian gender acquisition.

The participants in this study are 22 Greek-Norwegian bilingual children who are aged 3;07-9;07 and live in Norway. Two elicited production experiments were conducted in each language. The first experiment tested gender marking on real nouns and the second experiment on nonce nouns. Both experiments elicited indefinite and definite unmodified noun phrases. A parental questionnaire was distributed to collect background information about the participants.

The results show that Greek-Norwegian bilinguals follow the same acquisitional patterns, (e.g., gender acquisition order, gender default overgeneralization) in Greek and Norwegian as Greek monolinguals and bilinguals and Norwegian monolinguals and bilinguals, respectively. The results also demonstrate that the children are in the process of developing sensitivity to morphophonological gender cues in Greek, but they are not sensitive to the Norwegian morphophonological gender cues I tested.

Signs of positive cross-linguistic influence are observed in the acquisition of the neuter gender in Norwegian. Transparency seems to influence the pace of gender acquisition in both languages. While Greek gender is acquired fast, Norwegian gender is acquired slowly. Home language is found to play a significant role in the children's gender accuracy in Greek, but it does not affect their gender accuracy in Norwegian. Age influences the children's gender accuracy in Norwegian as children over 6 years are significantly more accurate than children below 6. No significant difference is found between the younger and older children's gender accuracy in Greek. Additionally, I observed that literacy and Greek schooling do not influence the children's gender accuracy in Greek or Norwegian. Finally, my findings indicate that birth order affects the Greek-Norwegian children's gender accuracy in Greek. First-born or only children are significantly more accurate in Greek gender marking compared to similarly aged second- and third-born children. Taken together, the findings of this study show that gender is a complex linguistic phenomenon from an acquisitional viewpoint and that there is an intricate interplay of factors that influence bilingual gender acquisition.

Sammendrag

Denne avhandlingen undersøker tilegnelse av grammatisk genus på gresk og norsk hos tospråklige gresk-norske barn. Både gresk og norsk har grammatisk genus i substantivfraser. Imidlertid er de to språkene fundamentalt forskjellige med hensyn til egenskapene som uttrykker genus som er tilgjengelige for barn, så vel som utviklingsmønstrene for genus observert hos enspråklige barn. Gresk byr på hyppige og konsistente morfologiske egenskaper som fører til rask tilegnelse av genus hos greske enspråklige barn (Mastropavlou, 2006). Norske morfologiske genusegenskaper er sjeldne og upålitelige, noe som forklarer for den langsomme tilegnelsen av genus hos norske enspråklige barn (Busterud et al., 2019; Rodina & Westergaard, 2015a)

I denne avhandlingen identifiserer jeg tilegnelsesmønstrene og standardverdiene for genus for både gresk og norsk, og jeg undersøker barnas sensitivitet til morfofonologiske genus egenskaper på hvert språk. Jeg undersøker også hvilken rolle tverrspråklig påvirkning, genustransparens, hjemmespråk, alder, leseferdighet, gresk undervisning og fødselsrekkefølge har i tospråklig gresk-norsk genustilegnelse.

Deltakerne i denne studien er 22 gresk-norske tospråklige barn som er i alderen 3;07-9;07 år og bor i Norge. To elisiteringseksperimenter ble utført på hvert språk. Det første eksperimentet testet genusmarkering på ekte substantiv og det andre eksperimentet på pseudosubstantiv. Begge eksperimentene søkte å fremkalle ubestemte og bestemte umodifiserte substantivfraser. Et spørreskjema ble delt ut til foreldrene for å samle inn bakgrunns informasjon om deltakerne.

Resultatene viser at gresk-norske tospråklige barn følger de samme tilegnelsesmønstrene, (f.eks. rekkefølgen av genustilegnelse, overgeneralisering av standardverdi) på gresk og norsk som henholdsvis greske en- og tospråklige og norske en- og tospråklige barn. Resultatene viser også at barna er i ferd med å utvikle sensitivitet til morfofonologiske genusegenskaper på gresk, men de er ikke sensitive til de norske morfofonologiske genusegenskapene jeg testet.

Tegn på positiv tverrspråklig påvirkning observeres ved tilegnelse av intetkjønn på norsk. Genustransparens ser ut til å påvirke tempoet i genustilegnelsen på begge språk. Mens gresk genus tilegnes raskt, tilegnes norsk genus sakte. Hjemmespråket er funnet å spille en betydelig rolle for barnas genusnøyaktighet på gresk, men det påvirker ikke deres genusnøyaktighet på norsk. Alder påvirker barnas genusnøyaktighet på norsk da barn over seks år er signifikant mer nøyaktige enn barn under seks år. Det er ikke funnet noen signifikant forskjell mellom de yngre og eldre barnas genusnøyaktighet på gresk. I tillegg observerte jeg at leseferdighet og gresk undervisning ikke påvirker barnas genusnøyaktighet på gresk eller norsk. Til slutt tyder mine funn på at fødselsrekkefølgen påvirker de gresk-norske barnas genusnøyaktighet på gresk. Førstefødte eller enebarn er betydelig mer nøyaktige i gresk genusmarkering sammenlignet med andre- og tredjefødte barn i samme alder. Samlet viser funnene i denne studien at genus er et komplekst språklig fenomen fra et tilegnelsessynspunkt og at det er et intrikat samspill av faktorer som påvirker tospråklig genustilegnelse.

Acknowledgments

First of all, I would like to express my deepest gratitude to my supervisors, Yvonne van Baal and Terje Lohndal. They shared their knowledge with me, guided me, and inspired me. Their constructive and detailed feedback and their dedication to answering my (long lists of) questions transformed my thoughts and ideas into this thesis. I also wish to thank them for their enthusiasm, patience, and emotional support. They believed in me and encouraged me to keep going. Yvonne and Terje, this thesis would not be the same without you.

Words cannot express my gratitude to the 25 children and their parents who participated in this project. Without them, this study would have been impossible. I am most thankful for having had the privilege to meet these wonderful children and observe a part of their language acquisition journey. I also want to thank the parents for welcoming me into their homes or traveling to Oslo to meet with me. Their genuine interest in my study and their eagerness to help were truly moving.

I would also like to extend my sincere thanks to NTNU's Department of Language and Literature for partially funding my fieldwork trip to Oslo.

I also want to thank all the people who helped me recruit participants for this project. I am very grateful to the Greek Orthodox Church of Oslo, and especially, Kiriaki Papadopoulou Samuelsen and Father Alexandros Loukatos for going to great extents to promote my call for participants, as well as for allowing me to use the church areas to conduct part of the data collection. I am also thankful to the Embassy of Greece in Oslo, and especially, to the Ambassador, Anna Korka, for sending my call for participants to Greek organizations in Norway.

I am also incredibly grateful to my friends and family. Several of them proofread parts or the entirety of this thesis, participated in the pilot study, and offered valuable advice whenever I was in doubt. I would be remiss in not thanking Panos and Yorgos who always made the time to talk, even though we were countries and time zones apart from each other. Your unwavering support and encouragement mean more than words can express. I also wish to thank Ingrid, for all the coffees, lunches, and dinners where we shared our academic joys and woes. I am also very grateful to my parents for believing in me, supporting me, and encouraging me to follow my dreams. Mom, thanks for always being eager to listen to me talk about this project. I am also very thankful to my Norwegian family. Tom and Tove, thank you for opening your home to me during my fieldwork trip in Oslo, for answering all my questions about Norwegian, and for offering emotional support when I needed it. Mathias, Kaia, and Magnus, thank you for making family gatherings such a fun break from working on this project.

Above all, I wish to thank my husband, Martin, for his constant love, unparalleled support, and unshakable belief in me. He showed genuine interest in this project, he patiently listened to me talk about it for countless hours and he reminded me to take breaks whenever I was very stressed. Martin, thank you for always having my back, through all the ups and downs of writing this thesis.

Trondheim, November 2022

Agoritsa Vangelokosta

Table of Contents

List of Figures

List of Tables

List of Abbreviations

1	First person
2	Second person
ACC	Accusative
DEF	Definite
F	Feminine

FLA	First Language Acquisition
GEN	Genitive
IC	Inflection Class
INDF	Indefinite
INF	Infinitive
M	Masculine
N	Neuter
NOM	Nominative
PASS	Passive voice
PRS	Present
PST	Past
RQ	Research Question
SBJV	Subjunctive mood
SG	Singular

1. Introduction

Many children across the globe grow up acquiring two languages simultaneously or shortly after each other. Often, this is either because they are raised in bilingual countries (e.g., Canada) or because they are exposed to two languages in two different settings, i.e., one majority language spoken in society and one ethnic or immigrant minority language spoken at home (e.g., a child raised in Norway by Greek parents). In the latter scenario, the children are heritage speakers of the minority language (Benmamoun et al., 2013). Since the second half of the last century, there has been a large body of research on bilingual language acquisition and the factors that contribute to it. This research has established that bilingualism is both attainable and unproblematic. However, bilinguals can differ from monolinguals both in terms of how they acquire certain grammatical features of their languages and in terms of the speed with which they acquire these features.

A linguistic feature that has gained a lot of attention in acquisitional research in the past two decades is grammatical gender. Hockett (1958) provides the following definition of *grammatical gender*: "Genders are classes of nouns reflected in the behavior of associated words" (p. 231). Gender is not present in all languages and its realization varies widely among the languages where it is present. This variation extends to the gender acquisition patterns observed in different languages. For instance, gender is acquired early in Italian, Greek, and German but late in Dutch and Norwegian (see Section 2.5).

This thesis investigates the bilingual acquisition of grammatical gender in Greek-Norwegian children. To the best of my knowledge, this is the first time that gender acquisition is studied in this language pair. While bilingual acquisition of Greek gender has been researched in many language pairs, research in bilingual acquisition of Norwegian gender is rather limited. The present study offers new insights into the bilingual gender acquisition of these two languages. As we will see in more detail in Chapter 2, Greek and Norwegian are extreme opposites when it comes to the transparency, reliability, and frequency of cues for gender marking that are available to the child. Additionally, monolingual acquisition of Greek gender is completed early and is characterized by a short-lived stage of overgeneralization of the gender default. By contrast, monolingual acquisition of Norwegian gender is completed late and is characterized by a long stage of overgeneralization of the gender default. Also, the two languages differ in terms of learner gender defaults; neuter is the gender default in Greek, and masculine is the gender default in Norwegian.

Since gender acquisition in this language pair has not been previously studied, one of the main goals of this thesis is to identify the acquisitional patterns as far as gender is concerned in the two languages. In addition, the differences between the two languages outlined above make them an ideal language combination for studying the potential role of cross-linguistic influence in bilingual Greek-Norwegian gender acquisition. This is another research aim of this study. The final goal of this study is to investigate which language-internal and language-

external factors may influence bilingual Greek-Norwegian gender acquisition. Specifically, I examine the role of transparency, home language(s), age, literacy, Greek schooling, and birth order. Previous research findings from various language pairs have shown that these factors (except for birth order) influence bilingual gender acquisition. Even though the role of birth order has been previously explored in vocabulary acquisition and grammatical complexity, the study of birth order in relation to bilingual gender acquisition is, to my knowledge, unique to the present study. The research questions relating to the goals I summarized above as well as my predictions regarding the results of this study are presented in more detail in Section 2.6.

The bilingual children who participated in the present study live in Norway and, therefore, acquire Norwegian as the majority language and Greek as the minority language to which they are exposed at home. This means that they are heritage speakers of Greek. However, in the present study, I use the term *bilingual* because I investigate gender acquisition both in the majority and the minority language. Finally, a few of the children are trilingual or multilingual, but for ease of exposition, the term *bilingual* is used to refer to all of this study's participants.

1.1. Outline

The present study consists of six chapters. In Chapter 2, I discuss grammatical gender and introduce essential concepts such as gender assignment, gender agreement, and gender default. In addition, I present the grammatical gender systems of Greek and Norwegian. This chapter also provides an overview of monolingual and bilingual gender acquisition and the factors that contribute to it, according to previous research. Finally, I outline the research questions that the present study intends to answer as well as my predictions regarding the findings.

In Chapter 3, I describe the experimental methods I used to collect the linguistic and demographical data that constitute the empirical basis for this study. I used two elicited production tasks in each language, one consisting of real nouns and one consisting of nonce nouns. Additionally, I designed and administered a parental questionnaire to collect background information about the participants. This chapter also describes the procedure followed during the data collection process and provides some information on the transcription of the data.

In Chapter 4, I present the results of the real and the nonce noun experiments in each language. These results reveal the gender acquisitional patterns in each language including the order in which the gender values are acquired (N-F-M in Greek and M-N-F in Norwegian), and the learner gender defaults (N in Greek and M in Norwegian). Next, I briefly compare the Greek with the Norwegian results, and I point out similarities, such as the article omission rates, and differences, such as the children's high accuracy scores in the neuter in Greek and their low accuracy scores in the neuter in Norwegian. Chapter 4 also presents the statistical data regarding the factors that may contribute to Greek-Norwegian bilingual gender acquisition.

In Chapter 5, I analyze and discuss the results which are summarized below. The gender acquisitional patterns that the Greek-Norwegian bilinguals exhibit in Greek and Norwegian are qualitatively similar to the patterns previously observed in Greek monolinguals and bilinguals and to Norwegian monolinguals and bilinguals,

respectively. For instance, in non-target-like nouns, the Greek-Norwegian bilinguals overgeneralize the same gender (N) as Greek monolinguals and bilinguals in Greek and the same gender (M) as Norwegian monolinguals and bilinguals in Norwegian. Only small quantitative differences are observed between the Greek-Norwegian bilinguals and Greek and Norwegian monolinguals from previous studies. One of these differences is that gender acquisition in Greek is somewhat delayed (see Section 5.1.1). Furthermore, the Greek-Norwegian bilinguals are found to be in the process of developing sensitivity to morphophonological gender cues in Greek, but they are not sensitive to the Norwegian morphophonological gender cues that I investigated. Concerning cross-linguistic influence, I notice that there may be an acceleration effect in the acquisition of the neuter gender in Norwegian (see Section 5.4). With respect to the factors I investigated, transparency, home language(s), age, and birth order play a role in bilingual Greek-Norwegian gender acquisition, whereas no effect is found for literacy and Greek schooling. In the last section of Chapter 5, I provide a brief evaluation of the methodology including some suggestions for improvement that could benefit future studies.

Finally, in Chapter 6, I summarise the main findings of the present study, discuss its limitations, and suggest ideas for future research.

2. Grammatical gender and its acquisition

The outline of this chapter is as follows. In Section 2.1, I introduce the concept of grammatical gender and discuss the notions of gender agreement, gender assignment, and gender default. In Section 2.2, I introduce the Greek and Norwegian gender systems which are central to this study. In Section 2.3, I briefly discuss first language acquisition in monolingual and bilingual children. Section 2.4 discusses findings from previous studies on grammatical gender acquisition by Greek and Norwegian monolinguals as well as bilinguals with Greek or Norwegian as one of their languages. In Section 2.5, I discuss the main factors that have been shown to play a role in bilingual acquisition of grammatical gender. Finally, the research questions and predictions regarding the findings of this study are outlined in Section 2.6.

2.1. Grammatical gender

Gender is a grammatical feature found in approximately half of the languages spoken today (Corbett, 2013). However, gender can vary widely from language to language in the number of genders, the assignment rules, and the extent and placement of gender marking (Audring, 2016). Additionally, gender can be subject to language change, which leads to the partial or complete loss of the feature in a language. Currently, the most widely accepted definition of grammatical gender is the traditional one provided by Hockett: "Genders are classes of nouns reflected in the behavior of associated words" (Hockett, 1958, p. 231).

Following this definition, grammatical gender is a lexical feature based on which nouns are classified, and its defining property is agreement. Gender can often be associated with other noun classification systems such as inflection class or other nominal properties, such as number or case, but unlike these, gender is not necessarily visible on the noun itself. Instead, the gender of a noun is visible on morphologically gender-marked elements that surround the noun, for example in articles. In other words, the gender of a noun is part of its lexical properties, but it is expressed through the syntactic process of agreement (Carstens, 2000). Depending on the language, gender agreement can be limited or very extensive. According to Audring (2016), agreement is commonly found in "adjectives, verbs, and pronouns, and many languages also mark gender on articles, numerals, and question words" (p. 4). All these elements can agree with the gender assigned to the noun. This can be illustrated with the Norwegian example *et stor-t hus* (a.N big-N house.N, 'a big house') where we see the neuter gender of the noun in the inflection of the indefinite article and the adjective. The Norwegian gender system is discussed in more detail in Section 2.2.2.

There are two types of rules that can dictate gender assignment: semantic rules and formal rules (Corbett, 1991, 2007). Semantic rules assign gender to nouns based on their meaning. Often, they concern semantic absolutes such as male/female or animate/inanimate, but in some languages, they can involve smaller concepts such as plants or stones (Audring, 2016). Corbett (1991) argues that all gender systems have a semantic core, but there are few languages where

the entire gender system is based solely on semantic rules (e.g., English).[1] In fact, semantic rules are often narrow in scope which means that there can be a high number of semantic rules in a language (Audring, 2016; Enger, 2009). Most languages combine semantic rules with formal assignment rules and have a mixed gender system. Formal rules assign gender to nouns based on their formal properties, which can be phonological or morphological (inflectional or derivational). They are often broader in scope than semantic rules and thus account for larger groups of nouns. An example of a formal rule in Greek is that nouns ending in *-ης (-is)* are masculine (see Section 2.2.1 for more on Greek gender). Another example of a morphological assignment rule is found in Dutch and German, where nouns with a diminutive morpheme are always neuter.

Corbett (1991) characterizes gender systems where there is a connection between the noun's morphophonological form and its gender as overt and gender systems that have no such connection as covert. However, the distinction between these two notions is not binary, but rather gradual (Corbett, 1991). For instance, the gender assignment in most Russian nouns is dictated by formal rules, but in some cases (e.g., nouns ending in palatalized consonants), gender is ambiguous. Furthermore, in German, most formal rules are only probabilistic, which means that there are many exceptions to the gender assignment rules. These examples illustrate the existence of gender systems that are neither covert nor overt but rather liminal. That is, they exist in between the two notions.

The gradual distinction between overt and covert gender systems seems to be related to a larger continuum along which gender systems can be placed: the continuum of gender transparency. According to Rodina et al. (2020), the degree of a gender system's transparency depends on (i) the number of gender values, (ii) the transparency of formal gender cues, and (iii) the transparency of gender agreement cues. In some gender systems, the level of transparency can also be affected by the complexity that the system exhibits because of syncretism (Velnić, 2020). Furthermore, these factors seem to have a hierarchical order. For example, the transparency of formal gender cues, i.e., the extent to which the gender of a noun can be predicted based on the form of the noun, is argued to be more influential than the number of gender values (Rodina et al., 2020). Rodina et al. (2020) distinguish three main types of gender systems along the transparency continuum. Type I involves transparent gender systems, such as Italian and Greek, type II includes semi-transparent gender systems, such as Russian and German, and type III contains non-transparent or opaque gender systems, such as Dutch and Norwegian.

It is essential to distinguish between the notions *gender assignment* and *gender agreement*. The assigned gender of a noun is part of its lexical properties and is based on the gender assignment rules of each gender system. Gender agreement, on the other hand, refers to the property that other linguistic elements surrounding the noun inflect in accordance with its gender value.

[1] Even though Corbett (1991) considers English to have grammatical gender because of the pronouns *he* and she, the present study does not consider English to be a language with gender because there is no phrase-internal grammatical gender agreement.

Finally, another important concept related to gender is *gender default*. Tsimpli and Hulk (2013) make a distinction between *learner default* and *linguistic default*. Specifically, the term learner default refers to the gender value that the learner chooses "in the earliest stage when input is either unavailable or unanalyzed as yet" (Tsimpli & Hulk, 2013, p. 128). This means that in each gender system there is a dominant gender value that is adopted in cases where the learner is in doubt. In many languages, this gender value is the most common gender value for nouns in the respective language and often seems to coincide with the linguistic default. However, there are gender systems where the linguistic default differs from the learner default, for example, in Dutch. The linguistic default is defined by the "elsewhere condition" (Tsimpli & Hulk, 2013, p. 129). This means that the linguistic default is the least specified gender value that is found in "contexts in which the relevant formal feature appears already valued (from the lexicon) and does not need to enter an agreement process" (Tsimpli & Hulk, 2013, p. 129).

Furthermore, Lohndal and Westergaard (2021) distinguish between *gender assignment default* and *gender agreement default*. The gender assignment default is the gender value assigned to new words that enter the language as well as the value assigned to all nouns by children until there is evidence that a different value should be assigned. On the other hand, the gender agreement default is "the gender that shows up in the absence of any gender cues" (Lohndal & Westergaard, 2021, p. 111). The two sets of terms (learner and linguistic gender default on the one hand, and gender assignment and gender agreement default on the other) refer to similar concepts. In the present study, I use the terms learner and linguistic default.

2.2. Gender in Greek and Norwegian

2.2.1. Gender in Greek

Greek has a three-way gender system (masculine-feminine-neuter) where gender is a property of the noun's stem and is morphologically reflected in noun endings. Greek has 11 noun endings, which Ralli (1994, 2000, 2002) classifies into 8 inflection classes, henceforth ICs 1-8 (cf. Anastasiadi-Symeonidi & Cheila-Markopoulou, 2003). Table 2.1 presents the noun endings found in each IC along with examples for each of them. As seen in the table, most noun endings are associated with one gender value, though there are masculine, feminine, and neuter nouns that end in *-ος (-os)*. Still, most of the nouns ending in *-ος (-os)* are masculine and monolingual adults mainly assign the masculine value to nonce nouns ending in *-ος (-os)* (Mastropavlou, 2006; Mastropavlou & Tsimpli, 2011; Varlokosta, 2011). There are occasional exceptions to other noun endings (e.g., *κρέ-ας, kré-as,* 'meat' is a neuter noun ending in *-ας (-as)*). In addition, we notice that the noun ending *-η (-i)* is present in both IC3 and 4. This is because the two ICs have different plural conjugation. For example, the plural nominative case form of the IC3 noun *φων-ή, fon-í,* 'voice' is *φων-ές, fon-és*, 'voices', whereas the plural nominative case form of the IC4 noun *λέξ-η, léx-i* 'word' is *λέξ-εις, léx-is,* 'words'. It is also worth noting that the noun endings *-η (-i)* and *-ι (-i)* are pronounced in the same way, which means that the phonological gender cue is ambiguous (feminine or neuter), but the morphological gender cue is not.

IC1 -ος (-os): M/F		**IC2 -ς (-s): M**	**IC3 -α (-a), -η (-i), -ου (-ou): F**	**IC4 -η (-i): F**
M **- ος (-os)** καιρ-ός ker-ós 'weather'	**F** **- ος (-os)** οδ-ός od-ós 'street'	**-ας (-as)** άντρ-ας ándr-as 'man' **-ης (-is)** ποδηλάτ-ης podilát-is 'cyclist' **-ες (-es)** καναπ-ές kanap-és 'sofa' **-ους (-us)** παππ-ούς pap-ús 'grandpa'	**-α (-a)** ώρ-α ór-a 'time/hour' **-η (-i)** φων-ή fon-í 'voice' **-ου (-ou)** αλεπ-ού alep-ú 'fox'	**-η (-i)** λέξ-η léx-i 'word'
IC5 -ο (-o): N		**IC6 -ι (-i): N**	**IC7 -ος (-os): N**	**IC8 -μα (-ma): N**
-ο (-o) βουν-ό vun-ó 'mountain'		**-ι (-i)** παιδ-ί ped-í 'child'	**-ος (-os)** λάθ-ος láth-os 'mistake'	**-μα (-ma)** πράγ-μα prág-ma 'thing'

Table 2.1: The Greek inflection classes based on Ralli (1994, 2000, 2002).

Summarizing, gender assignment in Greek follows morphological rules that are not entirely deterministic, but highly probabilistic since each morphological noun ending has a strong predictive value for only one gender (Mastropavlou, 2006; Mastropavlou & Tsimpli, 2011; Varlokosta, 2011).

An approach to the Greek gender assignment system that attributes a role to semantics is found in Anastasiadi-Symeonidi and Cheila-Markopoulou (2003), who argue that the assignment rules can be accounted for through the notion of *prototypicality*. Prototypicality is based on the semantic criterion of animacy ([±animate]) and the morphological criterion related to the different noun suffixes. Table 2.2 presents the interaction of noun ending, prototypicality, and gender in the Greek nominal paradigm according to Anastasiadi-Symeonidi and Cheila-Markopoulou (2003). As seen in the table, the noun ending *-ς (-s)* is considered prototypically masculine, the noun endings *-α (-a),* and *-η (-i)* are considered prototypically feminine, and the noun endings in *-ο (-o), -ι (-i),* and *-α (-a)* are perceived as prototypically neuter. It is important to note that under this analysis, the noun ending *-α (-a)* is prototypically both feminine and neuter, which indicates that unknown inanimate nouns ending in *-α (-a)* are ambiguous under this approach.

	Prototypical		Non-prototypical	
	+animate	-animate	+animate	-animate
Masculine	**-ς (-s)**		**-ς (-s)**	
	άντρ-ας ándr-as 'man'	-	-	καιρ-ός ker-ós 'weather'
Feminine	**-α (-a), -η (-i), -ου (-u)**		**-ς (-s)**	
	γυναίκ-α ginék-a 'woman' αδερφ-ή aderf-í 'sister' αλεπ-ού alep-ú 'fox'	ώρ-α ór-a 'time/hour' φων-ή fon-í 'voice'	δήμαρχ-ος dímarh-os 'mayor'	οδ-ός od-ós 'street'
Neuter	**-ο (-o), -ι (-i), -α (-a)**		**-ο (-o), -ι (-i)**	**-ς (-s)**
	μωρ-ό mor-ó 'baby' παιδ-ί ped-í 'child'	βουν-ό vun-ó 'mountain' χέρ-ι hér-i 'hand' βήμ-α vím-a 'step'	άλογ-ο álog-o 'horse' ψάρ-ι psár-i 'fish'	λάθ-ος láth-os 'mistake'

Table 2.2: The Greek assignment system according to Anastasiadi-Symeonidi and Cheila-Markopoulou (2003).

Both approaches agree that the morphophonological noun endings are a central part of gender assignment in Greek. In some cases, the assigned gender of the noun may be unambiguous based on the noun ending (e.g., *-ης (-is), -ες (-es), ους (-us)*), but in most cases, the gender value of the noun is seen through agreement. In Greek, agreement is expressed in adjectives, articles, determiners, pronouns, possessives, and numerals in the singular and plural number. An example of a gender agreement chain in each gender is given in (2.1). As demonstrated in the example, the article, adjective, and noun agree in terms of gender, case, and number. The noun ending reflects the gender of the noun and expresses its case and number. The article and adjective endings are synthetic morphemes that agree with the noun in terms of gender, case, and number.

(2.1)	Ένας/Ο	έξυπν-ος	άντρ-ας
	'Enas/O	éksipn-os	ándr-as
	INDF.M.SG.NOM/DEF.M.SG.NOM	clever-M.SG.NOM	man-M.SG.NOM
	'A/The clever man'		

Μια/Η	έξυπν-η	γυναίκ-α
Mia/I	éksipn-i	ginék-a
INDF.F.SG.NOM/DEF.F.SG.NOM	clever-F.SG.NOM	woman-F.SG.NOM
‘A/The clever woman’		

Ένα/Το	έξυπν-ο	παιδ-ί
‘Ena/To	éksipn-o	ped-í
INDF.N.SG.NOM/DEF.N.SG.NOM	clever-N.SG.NOM	child-N.SG.NOM
‘A/The clever child’		

There is a certain amount of syncretism in the nominal paradigm which can sometimes make it difficult to discern between genders and cases. That is, there is both within- and between-gender syncretism. Since the paradigm is quite complex, the syncretism that is present in the plural forms of the articles and nouns is not discussed here (the study focuses on gender in singular phrases). Within-gender syncretism can be seen in the nominative and accusative case of the feminine indefinite article and the noun endings *-α (-a),* and *-η (-i)* (see (2.2)).

(2.2)

Nominative		Accusative	
Μία	ώρ-α	Μία	ώρ-α
Mia	ór-a	Mia	ór-a
INDF.F.SG.NOM	hour-F.SG.NOM	INDF.F.SG.ACC	hour-F.SG.ACC
‘An hour’		‘An hour’	

Similarly, there is syncretism in the nominative and the accusative case of the indefinite neuter article (see (2.3)). The same is true for the neuter definite article (see (2.4)) as well as the neuter nouns ending in *-ο (-o), -ι (-i),* and *-μα (-ma)* (see (2.3) and (2.4)).

(2.3)

Nominative		Accusative	
Ένα	βουν-ό	Ένα	βουν-ό
‘Ena	vun-ó	‘Ena	vun-ó
INDF.N.SG.NOM	mountain-N.SG.NOM	INDF.N.SG.ACC	mountain-N.SG.ACC
‘A mountain’		‘A mountain’	

(2.4)

Nominative		Accusative	
Το	παιδ-ί	Το	παιδ-ί
To	ped-í	To	ped-í
DEF.N.SG.NOM	child-N.SG.NOM	DEF.N.SG.ACC	child-N.SG.ACC
‘The child’		‘The child’	

Finally, there is between-gender syncretism in the accusative case of the masculine indefinite article and the neuter indefinite article, (see (2.7)) as well as in the accusative case of the masculine definite article and the neuter definite

article (see (2.8)).[2] Additionally, there is syncretism in the accusative case of masculine nouns ending in *-ος (-os)* and *-ης (-is)* and in the accusative case of neuter nouns ending in *-ο (-o),* and *-ι (-i)* (see (2.7) and (2.8)).[3]

(2.7)	Accusative Masculine		Accusative Neuter	
	Ένα(ν)	ποδηλάτ-η	Ένα	παιδ-ί
	‘Ena(n)	podilát-i	‘Ena	ped-í
	INDF.M.SG.ACC	cyclist-M.SG.ACC	INDF.N.SG.ACC	child-N.SG.ACC
O	‘A cyclist’		‘A child’	

(2.8)	Accusative Masculine		Accusative Neuter	
	Το(ν)	ποδηλάτ-η	Το	παιδ-ί
	To(n)	podilát-i	To	ped-í
	DEF.M.SG.ACC	cyclist-M.SG.ACC	DEF.N.SG.ACC	child-N.SG.ACC
	‘The cyclist’		‘The child’	

With regard to gender default, Tsimpli and Hulk (2013) argue that neuter is the linguistic default in Greek, “on the grounds of syntactic distribution in contexts where gender agreement is inert” (p. 138). In addition, the neuter has been established as the unmarked gender value in Greek, i.e., the learner default, for several reasons. The neuter is the first gender to be acquired (Egger et al., 2018; Mastropavlou, 2006) and the most frequent gender in child and child-directed speech (Stephany & Christofidou, 2008). The latter is partially due to the syncretism present in the nominative and accusative cases of neuter articles and nouns as well as due to the neuter diminutive noun ending *-ακι (-aki)*. Additionally, the neuter is overused with real nouns by young Greek monolingual children (Mastropavlou, 2006) and Greek bilingual children and adolescents (Egger et al., 2018; Kaltsa et al., 2017). The same has been reported for Greek heritage speakers (Alexiadou et al., 2020) and L2 learners of Greek (Tsimpli, 2003). The neuter is also often preferred in nonce noun gender assignment and agreement by young Greek monolingual children (Mastropavlou, 2006) and by bilingual children (Kaltsa et al., 2017; Kaltsa et al., 2019; Karayiannis et al., 2021). Lastly, the neuter is slightly preferred by Greek adult monolinguals for nonce nouns ending in the phonetically ambiguous noun ending *-η/ι (-i)*.

All in all, the Greek gender system can be characterized as transparent because of its salient, frequent, and reliable morphophonological gender cues as well as its mandatory gender agreement. The complexity of the nominal paradigm and the presence of syncretic forms suggest that the Greek gender system is not as transparent as the Italian or the Spanish gender system. However, it is more transparent than semi-transparent gender systems like the Russian or German. In addition, the differing degrees of complexity as well as the within- and between-gender syncretism present in each gender indicate that each gender

[2] This is the case only when the word that follows the masculine indefinite article does not start with a vowel, a plosive, or an affricate. In these cases, the ending *-ν, (-n)* is added to the masculine indefinite article. However, this rule is often not followed in spoken language.
[3] It could be argued that there is also syncretism in the accusative case of masculine nouns ending in -ας (-as) and in the accusative case of neuter nouns ending in *-μα (-ma)* but this is only the case when the masculine noun’s lemma ends in *-μ (-m).*

varies in terms of transparency. Specifically, the neuter seems to be the most transparent gender in Greek because of the frequency of neuter gender cues in the input as well as the neuter's default status. The masculine seems to be the least transparent gender in Greek because it is the least frequent gender in the input (Stephany & Christofidou, 2008) and because of the masculine-neuter syncretism in the nominal paradigm.

2.2.2. Gender in Norwegian

The Norwegian language has a wide variety of dialects and two written language varieties: Bokmål and Nynorsk. In the present study, the examples are presented in Bokmål. Traditionally, Norwegian has a three-gender system that consists of masculine, feminine, and neuter. However, in Bokmål, one can choose between a two- and a three-gender system. The two-gender system consists of the common and the neuter genders where the masculine gender marking is used with (formerly) feminine nouns. Table 2.3 provides a brief overview of the traditional Norwegian gender system in many varieties of the language. As we can see, gender is marked on articles/determiners, definite suffixes, adjectives, and possessives. We notice that there is syncretism in the masculine and the feminine both in the definite prenominal determiners as well as in adjectives. Syncretism between the masculine and feminine is also found in some demonstratives and some quantifiers that are not on Table 2.3 (e.g., *denne hesten.M,* 'this horse', *denne senga.F,* 'this bed', *dette huset.N,* 'this house').

	Masculine	Feminine	Neuter
Indefinite	**en** hest 'a horse'	**ei** seng 'a bed'	**et** hus 'a house'
Definite	hest**en** 'horse'.DEF	seng**a** 'bed'.DEF	hus**et** 'house'.DEF
Double definite	**den** hest**en** 'that horse'.DEF	**den** seng**a** 'that bed'.DEF	**det** hus**et** 'that house'.DEF
Adjective	en **fin** hest 'a nice horse'	ei **fin** seng 'a nice bed'	et **fint** hus 'a nice house'
Possessive	**min** hest/hest**en min** 'my horse'	**mi** seng/seng**a mi** 'my bed'	**mitt** hus/hus**et mitt** 'my house'

Table 2.3: The traditional gender system in many varieties of Norwegian (Busterud et al., 2019)

The simultaneous existence of two gender systems in written Norwegian is related to an ongoing language change in many dialects. That is, several dialects, such as the Oslo dialect (Lødrup, 2011; Lundquist & Vangsnes, 2018), the Trondheim dialect (Busterud & Lohndal, 2022; Busterud et al., 2019), and the Tromsø dialect (Rodina & Westergaard, 2015a)are currently undergoing a transition from a three-gender system to a two-gender system. In these dialects, some or all realizations of the feminine gender are being overtaken by the masculine forms. This transition was first seen centuries ago, in the Bergen dialect (Trudgill, 2013). The masculine indefinite article *en* and the definite suffix *-en* replaced the feminine indefinite article *ei* and the feminine definite suffix *-a,* respectively, when it comes to formerly feminine nouns (Trudgill, 2013) (see (2.9)).

(2.9)

Bergen dialect			Three-gender dialect		
Indefinite		Definite	Indefinite		Definite
en	seng	sengen	ei	seng	senga

INDF.M.SG	bed.M.SG	bed.DEF.SG	INDF.F.SG	bed.F.SG	bed.DEF.SG
'a bed'		'the bed'	'a bed'		'the bed'

The Oslo, Trondheim, and Tromsø dialects are currently undergoing a similar change. That is, the feminine indefinite article is being replaced by the masculine in all three dialects. However, the extent to which the feminine definite suffix is being replaced by the masculine varies from city to city, with most replacements happening in Oslo and the fewest in Tromsø. In Oslo, this change was first reported by Lødrup (2011), who found that the feminine indefinite article is gradually being replaced by the masculine in younger speakers, whereas the feminine definite suffix remains generally intact. More recently, Lundquist and Vangsnes (2018) studied young speakers (17-18 years) of the Oslo dialect and found similar results with respect to the feminine indefinite article but a much more pronounced replacement of the feminine definite suffix by the masculine. In Trondheim, Busterud et al. (2019) found that the use of the feminine indefinite article is in decline in several age groups, especially adolescents and children. In addition, they observed signs of instability in the feminine definite suffix as some speakers occasionally used the masculine definite suffix with traditionally feminine nouns. In Tromsø, Rodina and Westergaard (2015a) found that young speakers use the masculine indefinite article with typically feminine nouns while generally retaining the feminine definite suffix. Gender use in the Oslo, Trondheim, and Tromsø dialects is illustrated in (2.10).

(2.10)

Oslo/Trondheim/Tromsø dialect			Three-gender dialect		
Indefinite		Definite	Indefinite		Definite
en	seng	senga/sengen	ei	seng	senga
INDF.M.SG	bed.M.SG	bed.DEF.SG	INDF.F.SG	bed.F.SG	bed.DEF.SG
'a bed'		'the bed'	'a bed'		'the bed'

When we look at the feminine gender loss pattern in these dialects, we notice an important distinction between the feminine indefinite article and the feminine definite suffix: the latter seems to be less unstable than the former. It has been argued that this is because the feminine definite suffix is not an exponent of gender but rather an exponent of declension class that expresses definiteness and number (Lohndal & Westergaard, 2021; Rodina & Westergaard, 2015a). If we apply Hockett's definition, "genders are classes of nouns reflected in the behavior of associated words" (Hockett, 1958, p. 231), this means that the definite suffixes in Norwegian do not reflect the gender of nouns. The interplay of gender and declension class has been a topic of much debate (see Lohndal & Westergaard, 2021). Nonetheless, there is an association between gender and declension class. This means that in a stable three-gender system, each gender corresponds to one declension class.[4] Traditionally, a feminine noun triggers what has often been called the feminine definite suffix (*-a*). In the dialects that are transitioning from a three-gender to a two-gender system, we notice that typically feminine nouns can trigger both the feminine and the masculine definite

[4] Some Norwegian dialects have more than three declension classes. For instance, in some dialects, there is one definite suffix for weak feminine nouns and one definite suffix for strong feminine nouns. There is nevertheless still a correspondence between gender and declension classes.

suffixes. In the present study, I do not regard the definite suffix a true gender marker, in line with Hockett's definition. However, for ease of exposition, I use the terms masculine, feminine, and neuter when referring to *-en, -a,* and *-et,* respectively. In order to allow for a comparison with Greek definite phrases, the Norwegian definite suffix is included in the study.

Gender assignment in Norwegian has been a topic of debate among scholars. Trosterud (2001) proposes that the gender of most Norwegian nouns is based on 43 assignment rules (3 general, 28 semantic, 9 morphological, and 3 phonological rules). However, most of these rules have proven highly unreliable because they have many exceptions. Rodina and Westergaard (2015a) claim that three rules have high predictability: (i) nouns that refer to male humans are masculine, (ii) nouns that refer to female humans are feminine, and (iii) nouns that end in *-e* are feminine. Gagliardi (2012) tested these assignment rules using nonce nouns and reported that Norwegian monolingual children (4;2-7;2 years) display a strong preference for assigning the masculine gender regardless of the gender cue. In addition, she observed a slight preference for the feminine in nouns with a female referent and in nouns ending in *-e.* Urek et al. (2022) suggest that the noun ending *-v* may provide a reliable morphophonological cue for neuter. They used nonce nouns to test the sensitivity of adult Norwegian monolinguals to the morphophonological gender cues *-e* and *-v* and found that the participants had an overwhelming tendency to assign the masculine gender to all nouns in an elicited production task (Urek et al., 2022). When the participants were provided with the three indefinite article options *en, ei*, and *et,* Urek et al. (2022) noticed that they were somewhat sensitive to the morphological gender cues*.* Overall, the Norwegian gender system is generally non-transparent (opaque) because the majority of gender cues are infrequent and unreliable.

When it comes to gender default, the masculine has been argued to be the learner default in Norwegian (Lohndal & Westergaard, 2021; Trosterud, 2001). The evidence supporting this argument is as follows: (i) the masculine gender is the most frequent (Rodina & Westergaard, 2015a; Trosterud, 2001), and it is even more frequent in varieties where the masculine and the feminine have collapsed into a common gender realized with the masculine forms; (ii) the masculine is overgeneralized with feminine and neuter nouns by monolingual and bilingual children (Rodina & Westergaard, 2013b), by heritage speakers of Norwegian (Lohndal & Westergaard, 2016), and by L2 learners of Norwegian (Anderssen & Busterud, 2022; Ragnhildstveit, 2010); (iii) Norwegian monolingual adults and children prefer assigning the masculine to nonce nouns (Gagliardi, 2012; Urek et al., 2022); (iv) most new words that enter the Norwegian language are masculine (Graedler, 1998; Johansson & Graedler, 2002).

With respect to the linguistic default in Norwegian, Lohndal and Westergaard (2021) propose the neuter as the underspecified "gender that shows up in the absence of any gender cues" (p. 111). This means that the learner default differs from the linguistic default in Norwegian. Such a difference has also been observed in Dutch. In fact, the difference between the defaults has been argued to play a role in the delayed gender discovery and therefore slow gender acquisition process in Dutch monolingual children (Tsimpli & Hulk, 2013). It would be interesting for future research to investigate if the difference in the two defaults

in Norwegian is to any extent responsible for the slow gender acquisition process in Norwegian monolinguals and bilinguals (see Section 2.4).

2.3. First language acquisition: monolinguals and bilinguals

Before exploring gender acquisition specifically, it is important to discuss first language acquisition (FLA) in general. Since FLA is a broad topic that surpasses the scope of this study, I will only briefly touch upon some basic concepts. Karmiloff and Karmiloff-Smith (2002) describe first language acquisition as "a journey that begins in the fluid of the womb and continues throughout childhood, adolescence, and even beyond" (p. 1). Studies have proven that near-term fetuses and new-borns can recognize their mother's voice (Kisilevsky et al., 2003; Mehler et al., 1978) as well as features of the language(s) she speaks (e.g., prosody) (Granier-Deferre et al., 2011; Mehler et al., 1988). This indicates that infants perceive different aspects of speech; hence, they start acquiring their language(s) long before they produce their first words.

Though there are individual quantitative differences in the timing of acquisition, all typically developing children go through the same stages (milestones) in the same order when acquiring their mother tongue(s). The first stage in FLA has been described as *cooing*, i.e., the production of vowel- or consonant-like vocalizations. The second stage is known as *babbling*: the production of syllabic strings (e.g., *ba-ba-ba*). The third stage involves single-word production and is referred to as the *one-word stage*. The next stage is described as the *two-word stage* where the child starts producing strings that consist of two words including nouns and verbs. During the third year of their lives, children often start producing strings of multiple words, also known as *telegraphic speech*. Children continue acquiring different aspects of morphology, syntax, semantics, and pragmatics until late into childhood, following predictable developmental patterns. However, the timing of acquisition of the same grammatical feature can differ vastly from language to language. For example, when it comes to the acquisition of grammatical gender, Greek monolingual children acquire gender by age 3;6 (Mastropavlou, 2006), whereas Norwegian monolingual children acquire gender by age 7 (Rodina & Westergaard, 2015a). This suggests that even though the order of the acquisitional stages is the same across languages, the order in which grammatical features are acquired can differ.

Even though children have acquired the basic components of their mother tongue by the age of five, language acquisition continues throughout adolescence when it comes to vocabulary size and quality, intra- and inter-clausal syntax, metaphorical language, and metalinguistic awareness (Berman, 2007). Vocabulary acquisition continues into adulthood, though at a much slower pace than in childhood. For instance, we learn words that refer to new concepts (e.g., internet) as adults (Karmiloff & Karmiloff-Smith, 2002). Nevertheless, many scholars argue that there is a critical or sensitive period for language acquisition. The critical period hypothesis proposes that children are highly sensitive to linguistic input early on, but their sensitivity declines around puberty (see Newport, 1990; Newport et al., 2001; Singleton & Ryan, 2004). Some scholars have proposed that there are different critical periods for the acquisition of different aspects of language (Ruben, 1997).

There are many different theories and central debates with regard to how language is acquired. Most theories place varying amounts of emphasis on the effects of different factors such as biological (nativist and structural approaches), social (sociopragmatic approaches), linguistic (processing and construction-based approaches), and cognitive (cognitive approaches). Karmiloff and Karmiloff-Smith (2002) provide a comprehensive account of these principal theories of grammar acquisition and argue that they all offer important insights into different aspects of acquisition.

Two main sets of approaches to language acquisition are *nativist* approaches and *usage-based* approaches. On the one hand, nativist and structural approaches assume an innate mechanism (often referred to as *Universal Grammar*) in the human brain which underlies all languages. This mechanism involves principles that are common across all languages and parameters that differ from language to language. These parameters usually have two possible settings, and the child chooses the setting depending on the language that he or she is exposed to. As such, these theories tend to emphasize the importance of the innate capacity to acquire language in addition to the importance of language input. On the other hand, usage-based approaches, such as the connectionist approach and the construction-based approach, do not assume an innate language device but maintain that the input contains all the information needed to acquire language. They also maintain that to acquire language, humans use the same general cognitive mechanisms used to learn other kinds of human behavior.

These two opposing approaches relate to two central debates in developmental linguistics: the nature-nurture debate and the domain specificity-domain generality debate. Saffran and Thiessen (2007) point out that these two debates are independent even though they are often confounded. In simple words, in the nature-nurture debate, there are linguists who argue that language is acquired because humans are born with an ability to acquire language (nature side) and linguists who argue that language is acquired because humans are exposed to linguistic input (nurture side). The consensus seems to be that both nature and nurture play an important role in FLA, but different acquisition theories put more emphasis on one or the other (see Gao, 2022 for a brief account of the debate). As far as the domain specificity-domain generality debate is concerned, there are those that maintain that humans have domain-specific mechanisms in the brain which are solely dedicated to language acquisition, while others maintain that domain-general learning mechanisms are used to acquire language. Domain specificity is often associated with nativist approaches whereas domain generality with usage-based approaches. However, as Saffran and Thiessen (2007) argue, domain-specificity has among others been documented for learned tasks, such as reading and writing, and domain-generality assumes learning mechanisms for language acquisition that are also innate.

A significant body of research has been conducted in order to discover how language is acquired. For years, language acquisition research focused on monolinguals which was valuable in gaining much of the knowledge we have today about language acquisition (e.g., the stages of language acquisition discussed above). However, as many scholars have realized, research on different types of language acquisition (e.g., simultaneous and sequential bilingual language acquisition, heritage language acquisition, atypical language acquisition,

etc.) is important in order to fully answer the question of how language is acquired. Bilingualism was considered to be damaging for children in the first half of the twentieth century (Darcy, 1953). For instance, Jespersen (1922) argued that a bilingual child is not able to acquire two languages as well as monolinguals of the respective languages and that learning two languages at the same time impairs the child's general learning abilities. The idea that bilingualism has negative effects on children was generally based on intuition and limited empirical research with uncontrolled variables (e.g., Saer, 1923).

In the second half of the 20th century and especially since the eighties, there has been extensive research on bilingual language acquisition which has shown that most bilinguals acquire their languages qualitatively similarly to monolinguals, and that differences between them are mostly quantitative (Meisel, 2006; Wiese et al., 2022). When it comes to quantitative differences, Genesee (2003) conducted a literature review on the rate of monolingual and bilingual development of several aspects of language. He concluded that even though some reports show that bilingual acquisition of linguistic structures dependent on frequency may be delayed, in most cases the acquisition ages reported for bilingual children are within the general timeframe that has been suggested for monolingual children (see also Meisel, 2006). This means that even though monolinguals have often been seen by society and researchers alike as the ideal native speakers (Meisel, 2006), there is no evidence supporting that the human brain is made to be monolingual. Of course, this should have been evident enough by the fact that more than half of the world is bilingual. In fact, some research has even reported that bilingualism may have positive cognitive effects on children (Bialystok et al., 2012; Ricciardelli, 1992) though this is a debated topic (Lehtonen et al., 2018).

2.4. Grammatical gender acquisition

In this section, I present the grammatical gender acquisition patterns that previous research has reported for Greek and Norwegian monolinguals and bilinguals. Since no studies have previously examined Greek-Norwegian bilingual gender acquisition, I discuss findings from studies where Greek or Norwegian was part of the language pair investigated.

Tsimpli and Hulk (2013) identify two stages in the acquisition of grammatical gender. In the first stage, the child discovers that the language has grammatical gender. In the second stage, the child knows that gender is a classification system for nouns and can form generalizations based on lexical and syntactic gender cues which aid him or her in the acquisition of different gender values for individual nouns. In other words, the child acquires all gender values and forms gender agreement chains in a target-like manner. Additionally, during the second stage, children can predict the gender of novel nouns. Both monolingual and bilingual children go through these stages, though some quantitative differences have been found (e.g., Egger et al., 2018).

2.4.1. Acquisition of grammatical gender in Greek

Taking into consideration the high degree of transparency of the Greek gender system, it is not surprising that Greek monolingual children discover and acquire gender early on. Mastropavlou (2006) found that Greek monolingual children

acquire gender at age 3;6, while other studies suggest that gender is acquired even earlier (cf. Marinis, 2003; Stephany, 1997; Stephany & Christofidou, 2008). Monolingual Greek gender acquisition is also characterized by a short-lived stage when children overuse the neuter, the learner default in Greek (see Section 2.2.1). Mastropavlou (2006) documented that 3-year-old Greek monolinguals overused the neuter 15% of the time, while 5-year-olds did so only 4% of the time. When it comes to gender assignment, Greek children seem to rely on morphophonological cues more than semantic cues (Mastropavlou, 2006; Stephany, 1997). Children also seem to be affected by the notion of prototypicality (see Section 2.2.1), in the sense that prototypical noun endings are acquired before non-prototypical ones (Anastasiadi-Symeonidi & Cheila-Markopoulou, 2003).

As discussed in Section 2.2.1, most Greek noun endings have high predictive gender values. Mastropavlou (2006), Mastropavlou and Tsimpli (2011), and Varlokosta (2011) conducted elicited production experiments using nonce nouns and found that Greek adult monolinguals exhibited strong preferences towards one gender value for each noun ending, except for the phonetically ambiguous *-η/ι (-i).* In that case, when the nonce nouns were only provided phonetically, both neuter and feminine responses were elicited with a slight preference for the gender default (neuter). However, when the written forms of the nonce nouns were provided, the adults showed strong preferences for the feminine in nouns ending in *-η (-i)* and for the neuter in nouns ending in *-ι (-i).* In addition, Mastropavlou (2006) conducted an experiment with nonce nouns to examine the morphophonological gender cue sensitivity of young Greek monolinguals. For the group of 5-year-old children, she found that they were more accurate in assigning gender to nouns with endings of high predictive value than to nouns with endings of low predictive value. The group of 3-year-old children was overall less accurate but exhibited a similar pattern to the one seen in the older children. This indicates that a certain amount of input is necessary before Greek monolingual children develop sensitivity to morphophonological gender cues. This also implies that monolinguals initially rely on other types of cues, i.e., lexical and syntactic cues, in order to acquire grammatical gender (Tsimpli & Hulk, 2013).

For bilingual children, gender discovery occurs early, as for monolinguals. Unsworth et al. (2014) used two elicited production experiments to investigate gender acquisition by simultaneous Greek-English bilinguals aged 4;2-6;9 who lived in Greece. They found that all children in this age group had discovered all three genders and that they performed at ceiling in all three genders, though slightly less accurate scores were observed in the masculine. Egger et al. (2018) used two elicited production tasks and one grammaticality judgment task to explore gender acquisition by Greek-Dutch bilingual children aged 4;4-13;3 who lived in the Netherlands. Unlike Unsworth et al. (2014), Egger et al. (2018) found that almost all children had discovered the three genders in Greek and all of them had acquired the neuter, but acquisition of the feminine and especially the masculine was more vulnerable. Children with higher vocabulary scores performed more accurately in the feminine and the masculine than children with lower vocabulary scores. The Greek-Dutch bilinguals overused the neuter on non-target-like feminine and masculine nouns, which indicates that they treat neuter as the default. Based on this acquisitional pattern, Egger et al. (2018) proposed

that Greek-Dutch bilinguals go through a prolonged second stage of gender acquisition compared to monolinguals because of bilingualism. In other words, the stage where the children's lexical knowledge allows them to form generalizations based on syntactic and morphophonological gender cues is prolonged in bilinguals.

Karayiannis et al. (2021) researched gender acquisition by Greek-English bilingual children aged 6-8 years and adolescents aged 15-18 who lived in Australia. Both groups demonstrated a similar pattern. That is, they did not perform at ceiling in any of the three genders, though the adolescents performed more accurately compared to the children. The children overused the neuter across genders and noun endings, whereas the adolescents assigned the target-like gender value most of the time. Karayiannis et al. (2021) argue that this pattern reveals a retreat to the gender default in this population. A retreat to the default was also observed in adolescent and adult heritage speakers of Greek who live in the USA (Alexiadou et al., 2020).

Kaltsa et al. (2017) examined gender acquisition in Albanian-Greek and Greek-English bilinguals aged 8-12 years; they used two elicited production tasks which elicited modified and unmodified nominal phrases. They found that both groups performed more accurately in the task that elicited unmodified nominal phrases. Albanian-Greek children performed at ceiling in all three genders, while English-Greek children performed at ceiling in the neuter but less accurately in the feminine and the masculine. This means that both groups had completed the first stage of gender acquisition. The difference in performance was attributed to differences in language dominance and age of onset between the two groups (see Section 2.5). Similar results are also seen in Kaltsa et al. (2019), where Greek-German and Greek-English children aged 10-12 years were studied. Both groups performed quite highly, but below ceiling, on all three genders, which indicates that they had discovered all three genders but had not fully acquired all of them. The Greek-German children performed more accurately, which was attributed to cross-linguistic influence (see Section 2.5)

Bilingual children's sensitivity to the morphophonological gender cues of Greek noun endings has also been recently studied. Karayiannis et al. (2021) explored the bilingual participants' sensitivity to the morphophonological gender cues of Greek noun endings by conducting an experiment with nonce nouns. Firstly, they found that all participants were more accurate in assigning gender to real nouns in comparison to nonce nouns. The children assigned all three gender values with an overwhelming preference for the neuter across noun endings. With respect to nouns with high masculine or feminine predictive values, the children's second choice was the expected one. On the other hand, the adolescents primarily assigned the expected gender and secondarily the default to nouns with high masculine or feminine predictive value. Interestingly, their preferences for nouns with endings of strong neuter predictive value indicate that they view these suffixes as ambiguous, unlike Greek monolinguals. These patterns reveal that the Greek-English bilinguals are at least to some extent sensitive to morphophonological gender cues and that the development of sensitivity to morphophonological gender cues differs mainly quantitatively and somewhat qualitatively compared to Greek monolinguals (Karayiannis et al., 2021).

Kaltsa et al. (2017) investigated the Albanian-Greek and the Greek-English bilinguals' sensitivity to morphophonological gender cues using two elicited production tasks with nonce nouns. They reported that both groups were more accurate in gender assignment and agreement in the real noun tasks. Similar to the real noun results, the Albanian-Greek children were more accurate in gender assignment and gender agreement with nonce nouns compared to the Greek-English children. Kaltsa et al. (2017) argued that this demonstrated that Albanian-Greek children were more sensitive to gender cues than Greek-English children because Albanian has gender whereas English does not. Nevertheless, both groups demonstrated some sensitivity to morphophonological gender cues, even though the neuter was overused, especially by the Greek-English children. Similar results were reported for the nonce noun tasks in Kaltsa et al. (2019).

Interestingly, more accurate performances are seen in the nonce noun tasks in Kaltsa et al. (2017) and Kaltsa et al. (2019) compared to the one in Karayiannis et al. (2021). It is important to point out that the former two studies used nonce nouns that share stress patterns with real nouns from which they are distinct only by a single phoneme. This could cause activation of the real noun in the hearer's mental lexicon which could influence their gender choice. As such, the activation of the real nouns may have facilitated their performance. This may explain the higher accuracy scores in these studies compared to Karayiannis et al. (2021), where nonce nouns that were distinct from real nouns by at least two phonemes were used.

Overall, monolingual and bilingual gender acquisition in Greek are very similar from a qualitative viewpoint but differ slightly from a quantitative viewpoint. Both populations follow the same stages to acquire gender in Greek and treat the neuter as the default. Additionally, while keeping in mind that the bilinguals' sensitivity to morphophonological noun endings is still developing, it seems to be mostly qualitatively similar to the sensitivity of monolinguals. Gender discovery seems to occur early both for bilinguals and monolinguals. However, the second stage of gender acquisition seems to be prolonged in bilinguals, which is seen in their gender assignment and agreement accuracy scores with real nouns and their prolonged overuse of the neuter. The prolonged second stage of gender acquisition is also seen in the fact that bilinguals do not seem to have completed the formulation of generalizations based on lexical and syntactic cues in order to be able to accurately predict the gender of nonce nouns.

2.4.2. Acquisition of grammatical gender in Norwegian

Unlike gender acquisition in Greek, gender acquisition in Norwegian can be described as a late phenomenon in monolingual children, which is presumably due to the high degree of opacity of the gender system. Rodina and Westergaard (2015a) show that the Norwegian gender is not in place in monolinguals until approximately the age of 7. The delayed gender acquisition in comparison to other languages seems to concern mainly gender agreement (e.g., gender marking on indefinite articles, possessives, etc.). Even though there is some association between gender and declension class, the latter develops relatively early. In fact, Rodina and Westergaard (2013b) suggest that the acquisition of definite suffixes may be the trigger for gender acquisition in Norwegian.

Rodina and Westergaard (2013b) investigated gender acquisition based on longitudinal data (Anderssen, 2007; Bentzen, 2000) from four children born in the 1990s: two monolinguals aged 2;10-3;3 and 2;6-2;10 and two English-Norwegian bilinguals aged 1;8.8-2;7.24 and 2;7.10-2;10.9. While there was considerable variation among the children, they found that all children performed most accurately in the masculine and least accurately in the neuter with respect to gender marking of indefinite articles. Additionally, all children seemed to overgeneralize the masculine with both feminine and neuter nouns, which supports the claim that the masculine is the learner default in Norwegian. However, Rodina and Westergaard (2013b) noted that the children performed at ceiling in all definite suffixes, even in nouns where the indefinite article gender agreement is not target-like. This means that the definite suffixes seem to be in place relatively early on, which supports the distinction between gender and declension class in Norwegian that has been argued for (see Section 2.2.2). Finally, even though the sample of this study was small, it is important to point out that Rodina and Westergaard did not notice any significant differences between the performance of the bilinguals compared to the monolinguals.

Busterud and Lohndal (2022) investigated gender acquisition based on longitudinal data from three Norwegian monolingual children aged 2;3.9-2;9.2, 1;10.17-2;8.21 and 2;1.9-2;8-11 who were born in 2010 (the Ringstad corpus available in the CHILDES database). Their results are similar to the ones in Rodina and Westergaard (2013b). That is, all three children are target-like in the three definite suffixes and in the masculine indefinite articles. However, they often overused the masculine indefinite article with neuter and especially with feminine nouns. Similar results are found by Gagliardi (2012) who tested nine Norwegian monolingual pre-schoolers (aged 4;2-5;9) and eleven Norwegian monolingual primary school children (aged 6;4-7;2) to investigate whether they took into account noun-internal and noun-external distributional information when assigning gender to real and nonce nouns. For real nouns, she found that the children were target-like in the masculine and the neuter, but they often overgeneralized the masculine with feminine nouns (see Section 2.2.2 for discussion of the nonce nouns).

Rodina and Westergaard (2015a) explored gender marking on indefinite modified nominal phrases and double definite modified nominal phrases in five different age groups of speakers of the Tromsø dialect. For indefinite articles, the group of preschool children (aged 3;6-6;0) performed at ceiling in the masculine but were less accurate with neuter nouns, and even less accurate with feminine nouns. The masculine was overgeneralized in these cases. The group of young primary-school children (aged 6;6-8;2) showed target-like performance both in the masculine and the neuter, but the feminine remained non-target-like. This indicates the loss of the feminine in the dialect (see also Section 2.2.2.). When it comes to the double definite nominal phrases, all three definite suffixes were at target-consistent levels already in the preschool children. This further confirms that the definite suffixes are in place early on and before the indefinite articles in Norwegian. Busterud et al. (2019) conducted the same study in Trondheim and observed very similar results. The main difference between the two studies is that all participants (especially the children) overgeneralize the masculine indefinite article with feminine nouns to an even greater extent in Trondheim than in

Tromsø. Additionally, the feminine definite suffix does not seem to be in place yet in the group of preschool children (aged 3;4-5;9) in Busterud et al. (2019), while it is in place in that age group in Rodina and Westergaard (2015a). The feminine definite suffix is essentially target-like in the group of young primary school students (aged 6;1-7;4) in Busterud et al. (2019). This difference may indicate the start of the loss of the feminine definite suffix in the Trondheim dialect.

As far as bilingual gender acquisition of Norwegian is concerned, Rodina and Westergaard (2013a) elicited indefinite and double definite modified nominal phrases from twelve Norwegian-Russian bilingual children aged 4;11-11;10 who lived in Norway and from a control group of Norwegian monolingual children. With respect to the control group, their findings are similar to the results observed in Busterud and Lohndal (2022). Regarding the Norwegian-Russian bilinguals, they found that they were target-like in the masculine indefinite article but scored lower in the neuter and especially in the feminine. Additionally, they found that similarly to Norwegian monolinguals, the children overgeneralized the masculine with neuter and feminine phrases. In the double definite nominal phrases, most children overused the masculine definite suffix with neuter nouns, while some children were to some extent non-target-like in all three definite suffixes, and the masculine definite prenominal determiner was overgeneralized with neuter phrases. However, Rodina and Westergaard (2013a) note that the children's performance was still more accurate in the double definite nominal phrases compared to the indefinite ones, which shows that the bilingual children generally display the same acquisitional pattern as Norwegian monolinguals and Norwegian-English bilinguals (Rodina & Westergaard, 2013b).

Furthermore, Rodina and Westergaard (2015b) explored gender acquisition in twenty Norwegian-Russian bilingual children who lived in Norway. Ten of the participants were exposed to only Russian at home (age range: 4;1-7;11) and the remaining ten were exposed to both Russian and Norwegian at home (age range: 4;3-7;6). Additionally, they tested a control group of Norwegian monolingual children. Their results from the monolingual controls are in line with the results seen in Busterud and Lohndal (2022). Their findings from the Norwegian-Russian children resemble those of Rodina and Westergaard (2013a) in that both groups of bilinguals were target-like in the masculine indefinite gender agreement, but they overused the masculine indefinite article with neuter and especially with feminine nouns. Accordingly, the Norwegian-Russian bilinguals were essentially target-like in the masculine with regards to double definite phrases, but they overgeneralized the masculine prenominal definite determiner and the masculine definite suffix with neuter nouns. The observed differences between the two groups indicate that amount of input is an important factor in bilingual acquisition of gender, as is discussed further in Section 2.5.

In summary, monolingual and bilingual acquisition of Norwegian gender is qualitatively similar. As far as the indefinite gender agreement is concerned, both monolinguals and bilinguals are very accurate in the masculine (i.e., the default), which they overuse with feminine and neuter nouns. However, the overgeneralization of the masculine with feminine noun phrases seen in these studies differs from the overgeneralization of the masculine with neuter noun phrases. The former is probably an indication of the loss of the feminine gender rather than a stage in the acquisition of the traditional Norwegian three-gender

system. Unlike the slow acquisition of the indefinite gender agreement, the Norwegian definite suffixes are in place much earlier and the feminine definite suffix is generally retained. This can be taken as evidence for the distinction between gender and declension class in Norwegian. Finally, only some minor quantitative differences are observed in the Norwegian-Russian bilinguals' accuracy scores compared to those of Norwegian monolinguals.

2.5. Factors contributing to bilingual gender acquisition

In the present section, I discuss the role of cross-linguistic influence and the role of some of the main language-internal (transparency) and -external (input, age literacy, schooling) factors that have been previously found to contribute to bilingual gender acquisition in various language pairs. In addition, I refer to the role of birth order in the bilingual acquisition of other language aspects since this factor has not been investigated in relation to grammatical gender.

In the past two decades, research on bilingual gender acquisition has started exploring the potential role of positive cross-linguistic influence in the form of acceleration and negative cross-linguistic influence in the form of delay. Here, the term cross-linguistic influence refers to the influence that the structure of one language has on the other language. Cornips et al. (2006) investigated the acquisition of determiner-noun, adjective-noun, and relative pronoun-noun gender agreement in Dutch by Dutch-Moroccan and Dutch-Turkish children aged 10;5-12;11 who lived in the Netherlands. They found that the Dutch-Moroccan children were more accurate than the Dutch-Turkish children and as accurate as Dutch monolinguals in the relative pronoun-noun gender agreement in neuter nouns. The positive cross-linguistic effect was attributed to the fact that Moroccan Arabic and Berber (the first languages of these children) have grammatical gender whereas Turkish does not.

Similar results were documented in Kaltsa et al. (2019). They reported that Albanian-Greek children were overall more accurate at marking gender in Greek than Greek-English children and attributed this to positive cross-linguistic influence from Albanian. The same was observed again in Kaltsa et al. (2019), where German-Greek children were more accurate in gender marking than Greek-English children, partially because of a positive cross-linguistic effect from their other language that has grammatical gender (German). These results indicate that children who acquire two languages that encode gender seem to be more sensitive to gender cues than children who acquire one language that encodes gender and one that does not.

Egger et al. (2018) also found a positive cross-linguistic effect when they compared Greek-Dutch bilingual children aged 5-6 and 10-13 years to age-matched English-Dutch bilingual and Dutch monolingual children. Specifically, they found that overall, the Greek-Dutch children were more accurate in production and grammaticality judgment in neuter nouns than the English-Dutch children. Additionally, they reported that the young Greek-Dutch bilinguals performed similarly to their Dutch monolingual peers in production and grammaticality judgment of neuter nouns and more accurately than the Dutch monolinguals in the production of adjectives with neuter nouns. Egger et al. (2018) argue that the Greek-Dutch children's performance suggests the

acceleration of gender discovery in Dutch due to the simultaneous acquisition of Greek, where gender awareness emerges early on.

When it comes to negative cross-linguistic influence, Eichler et al. (2013) found that accuracy in the neuter gender in German is lower in Spanish-German, Italian-German, and French-German bilingual children compared to German monolingual children. Eichler et al. (2013) suggest that the simultaneous acquisition of a two-gender language (Spanish, Italian, and French) and a three-gender language (German) causes a negative cross-linguistic effect, i.e., delay of target-consistent gender marking in the neuter in German (the category that the other languages do not have). Anderssen and Bentzen (2013) also documented a temporary negative cross-linguistic effect in the acquisition of definiteness (which may be related to gender acquisition) in a young Norwegian-English bilingual child (aged 2;7.10-2;10.9). Specifically, they found that, unlike Norwegian monolingual children, the English-Norwegian bilingual child often used the prenominal definite marker instead of the target-like definite suffix in Norwegian. Anderssen and Bentzen (2013) argue that this preference is due to cross-linguistic influence from English.

It is noteworthy that in all studies where cross-linguistic influence was observed, it was the most transparent gender system that influenced the least transparent gender system. Therefore, cross-linguistic influence seems to be related to one of the main language-internal factors in bilingual gender acquisition: transparency. As discussed in Section 2.1, there are three types of gender systems along the continuum of transparency: transparent, semi-transparent, and non-transparent (or opaque) gender systems. Research on monolingual gender acquisition of different languages has shown that gender systems with higher degrees of transparency are acquired earlier than gender systems with lower degrees of transparency. For instance, Italian gender (transparent) is in place in Italian monolinguals by age 2;6 (Velnić, 2020) which is earlier than German gender (semi-transparent). German monolinguals acquire gender by age 4 (Jansen, 2009). Accordingly, monolingual German gender acquisition occurs earlier than monolingual Dutch gender (non-transparent) acquisition, which is completed after age 6 (Unsworth, 2013).

In bilinguals, acquisition of transparent gender systems seems to be unimpeded even when the transparent gender system belongs to the minority language. Unsworth et al. (2014) investigated Greek gender acquisition by Greek-English simultaneous bilinguals with varying levels of exposure to Greek (19-92%) and found that both stages of gender acquisition had been completed. Egger et al. (2018) concluded that the transparency of Greek is sufficient for gender discovery even though Greek was the minority language for the Greek-Dutch bilinguals in their study. However, they observed that the second stage of gender acquisition is prolonged compared to Greek monolinguals, which indicates that a high degree of transparency is not a sufficient condition for successful bilingual gender acquisition. In other words, a certain amount of input is necessary even for the acquisition of transparent gender systems.

In fact, the results of many studies have shown that transparency is intricately interrelated with probably the most important language-external factor, i.e., amount of input. Kupisch et al. (2002) explored gender acquisition by balanced

Italian-German bilingual children and French-German bilingual children who acquired French as the weak language. They reported that the French-German bilinguals were less target-like at marking gender in French (semi-transparent) when compared to French monolinguals than the Italian-German children were in Italian (transparent) when compared to Italian monolinguals. Both transparency and amount of input seem to have played a role in this case.

Rodina and Westergaard (2013a) and (2015b) examined gender acquisition by Norwegian-Russian bilinguals who lived in Norway. They found that the bilingual children who were exposed to Russian by both parents performed significantly more accurately in the gender marking of both opaque and transparent Russian nouns compared to children who were exposed to Russian only by one parent. Importantly, the two group's performances did not differ in Norwegian, their majority language. Furthermore, Rodina and Westergaard (2013a) and (2015b) observed that the children who were only exposed to Russian by one parent exhibited qualitative differences in Russian gender marking both in comparison to the other Norwegian-Russian bilingual group and to Russian monolinguals. According to the authors, this may indicate the acquisition of a reduced gender system in Russian by these bilinguals as the result of limited input. Their findings also suggest that the amount of input is important even for the acquisition of transparent nouns in bilingual Russian acquisition.

Moreover, Rodina and Westergaard (2013a) and (2015b) investigated gender acquisition in Norwegian, which has a non-transparent gender system. They found that Norwegian gender acquisition was only slightly slower in the Norwegian-Russian bilinguals compared to Norwegian monolinguals which seems to be due to bilingualism. Similar results were observed by Unsworth et al. (2014); they found that simultaneous English-Dutch bilingual children who lived in the Netherlands scored only slightly less accurately than Dutch monolinguals in the neuter because bilinguals receive less input in each language. Therefore, it seems that lack of transparency in the gender systems poses qualitatively similar challenges both for monolingual and bilingual children, which can lead to a slow gender acquisition process compared to more transparent gender systems.

Gathercole and Thomas (2009) explored gender acquisition by English-Welsh children and found that primarily the amount of exposure to Welsh at home and secondarily the amount of exposure to Welsh at school played a significant role in the accuracy of gender marking in the minority language (Welsh). Additionally, they suggested that bilinguals with insufficient exposure to the minority language may not be able to acquire more complex or opaque aspects of the gender system, which could lead to the development of a reduced gender system. This is in line with what Rodina and Westergaard (2013a) and (2015b) suggested for the Norwegian-Russian bilinguals who receive limited input in Russian. Finally, Unsworth et al. (2014) examined gender acquisition by Greek-English and English-Dutch children and reported that children with a higher amount of exposure to Greek and Dutch, respectively, were more accurate in marking gender compared to children with lower amount of exposure to Greek or Dutch.

Another factor related to input is the amount of input received over time. That is, the total amount of exposure to the language that a child has received from the time he or she was first exposed to the language until the time of testing.

Unsworth (2013) investigated gender acquisition by English-Dutch bilinguals aged 3-17 years and found that the amount of exposure to Dutch over time played a significant role in the gender accuracy scores of the participants in relation to neuter nouns. This means that the participants with higher amount of exposure to Dutch over time produced more accurate definite determiners with neuter nouns than those with lower amount of exposure to Dutch over time. Unsworth et al. (2014) also found that amount of input over time plays an important role in the gender accuracy scores of English-Dutch simultaneous bilinguals, early successive bilinguals, and Dutch L2 learners. Specifically, they report that children with higher amount of input in Dutch over time were more accurate in marking gender, especially on neuter nouns in comparison to children with lower amount of input over time. Interestingly, they also found that amount of input over time was not as significant as current amount of input for gender accuracy in Greek in Greek-English bilingual children. Lastly, Gathercole and Thomas (2005) documented that the amount of exposure to Welsh over time had some positive effects in English-Welsh bilingual children's ability to mark gender in Welsh, in the sense that older children showed some improvement in marking gender accurately.

Literacy has also been shown to play a role in bilingual gender acquisition. Rodina et al. (2020) investigated bilingual (heritage) acquisition of Russian in five different bilingual populations and concluded that literacy training is important for grammatical gender acquisition in Russian. In addition, Kaltsa et al. (2017) and Kaltsa et al. (2019) tested the impact that early literacy may have on bilingual gender acquisition of Greek by Albanian-Greek and English-Greek as well as by German-Greek and English-Greek bilingual children, respectively. In this case, early literacy was measured by whether family members read books to the children during their preschool years (until age 6) and in which language(s) they did so. Both studies demonstrated that early literacy in Greek had a positive effect on the bilinguals' gender accuracy scores in nonce nouns.

The role of schooling in bilingual gender acquisition has also been recently explored. Kaltsa et al. (2019) researched Greek gender acquisition by German-Greek and English-Greek bilinguals who either attended bilingual schools with the majority of instruction hours in German or English or monolingual schools in German or English and some weekly instruction in Greek. This study documented that hours of Greek schooling were a significant factor for the children's performance in the nonce noun tasks in Greek. That is, children with more hours of Greek schooling performed more accurately than children with fewer hours of Greek schooling. Prentza et al. (2019) compared the Greek gender accuracy scores of Albanian-Greek bilingual children who attended bilingual schooling to those of Albanian-Greek bilingual children who attended monolingual schooling in Greek. Interestingly, they reported that the bilingual children who attended bilingual schooling were more accurate in marking gender in Greek nonce nouns than the bilinguals who attended monolingual schooling. This finding indicates that bilingual schooling can have a positive effect on gender acquisition.

Even though there is anecdotal evidence for the role of birth order in bilingual acquisition of grammar, to the best of my knowledge, there has been no research on the contribution of birth order in bilingual gender acquisition. Therefore, I discuss studies investigating the relation between birth order and bilingual

acquisition of the minority language in general. Shin (2002) administered a parental survey to examine language use in 204 Korean American first-born, 204 Korean American second-born, and 41 Korean American third-born children and adolescents aged 4-18. She found that parents spoke less Korean (and more English) to their second-born and even less to their third-born children in comparison to their first-borns. In addition, she documented that later-born children acquired the majority language (English) earlier than first-borns, because later-born children were introduced to the majority language by their older sibling(s) at home. Lastly, she noted that first-born children were the most proficient in the minority language (Korean) and the most likely to prefer using Korean over English.

Similar results are observed in Bridges and Hoff (2014), who conducted two studies with young English-Spanish bilingual children (16 to 30 months old), using parental questionnaires and development inventories. Specifically, they documented that school-aged children spoke mainly English (the societal language) to their younger siblings; in turn, this increased the amount of English that the mothers spoke to their children. Importantly, they also found that toddlers without older siblings were more advanced both in vocabulary and in grammatical complexity in the minority language compared to toddlers with older siblings. The role of birth order in lexical acquisition was also explored by Lauro et al. (2020) in a longitudinal study with 126 English-Spanish bilingual children. They found that first-borns and only children had higher vocabulary scores in Spanish compared to later-born children.

2.6. Research goals and questions

Until now, research on bilingual gender acquisition in a language pair consisting of an opaque and a (semi-) transparent gender system has only been conducted on the language combinations Greek-Dutch and Russian-Norwegian (Egger et al., 2018; Rodina & Westergaard, 2013a, 2015b; Unsworth et al., 2014). No research has focused on bilingual Greek-Norwegian gender acquisition before, which is what this study contributes to the field. It is worth noting that this language pair is highly interesting from an acquisitional point of view because the two languages have a different level of transparency as well as different gender defaults. The study has two central research goals: (i) to identify the acquisitional patterns and the gender defaults in Greek-Norwegian grammatical gender acquisition and (ii) to investigate which factors influence the acquisition of grammatical gender in Greek-Norwegian bilingual children. To achieve these goals, this study addresses the following research questions:

1. What are the acquisitional patterns in the bilingual Greek-Norwegian gender acquisition of Greek and Norwegian?
2. How do these acquisitional patterns compare to Greek and Norwegian monolingual and other Greek or Norwegian bilingual children?
3. What is the gender default of Greek-Norwegian bilingual children in Greek and Norwegian, and how does this compare to the monolingual default?
4. Do Greek-Norwegian bilingual children take morphophonological cues for gender assignment into account?
5. Is there cross-linguistic influence in the Greek-Norwegian gender acquisition?

6. Which factors influence the acquisition of grammatical gender in Greek-Norwegian bilingual children?

All predictions about the results of the present study are based on the literature reviewed in the previous sections.

This study investigates the gender acquisitional patterns in Greek-Norwegian bilingual children both in Greek and Norwegian (RQ1). The results are then qualitatively compared to monolingual Greek and Norwegian gender acquisitional patterns, respectively. In addition, they are compared to results from other bilinguals with Greek or Norwegian as one of their languages (RQ2). It is important to note that I did not collect data from monolinguals or other bilinguals. Instead, I compare the results of this study with findings from previous research discussed in Sections 2.4 and 2.5. As far as Greek gender acquisition is concerned, the following predictions can be made based on previous research (see Section 2.4.1): (i) all children have discovered the grammatical gender feature, (ii) all children have acquired the neuter gender, but accuracy in the feminine and masculine genders varies, and (iii) some overgeneralization of the neuter gender is expected with masculine and feminine noun phrases.

Based on previous research from Norwegian monolingual and bilingual gender acquisition (see Section 2.4.2), my predictions for the Norwegian acquisitional patterns are as follows: (i) all children have discovered that Norwegian has gender, (ii) most children will have higher accuracy scores in the masculine than in the neuter, (iii) most children will have higher accuracy scores in the definite condition, (iv) most children will produce few or no feminine indefinite articles, (v) not all children will produce feminine definite suffixes in feminine nouns, and (vi) most children will overuse the masculine values with neuter nouns at least to some extent.

RQ3 investigates the gender default that Greek-Norwegian bilingual children have in each language. The two languages differ with respect to their learner gender default. Previous findings from monolingual and bilingual acquisition of Greek (see Sections 2.2.1 and 2.4.1) show that the neuter is the learner default in Greek. Therefore, I predict that the neuter is the Greek gender default in Greek-Norwegian bilinguals, too. When it comes to Norwegian, the learner gender default is the masculine (see Sections 2.2.2 and 2.4.2) and thus, I predict that the same will be true for the Greek-Norwegian bilinguals.

Whether the children use morphophonological gender cues (RQ4) is investigated with the help of a nonce noun task. When it comes to sensitivity to gender cues in Greek, I anticipate that: (i) the Greek-Norwegian bilinguals will overuse the neuter across suffixes, (ii) older children will predict the gender of novel Greek nouns more accurately than younger children, and (iii) the Greek-Norwegian bilinguals will be more accurate in assigning gender to nonce nouns compared to the young Greek-English bilinguals in Karayiannis et al. (2021). For Norwegian, I expect that the children will not display sensitivity to the gender cues provided by the noun endings *-e* and *-v* and that they will assign the masculine to all nouns (see Section 2.2.2).

These four RQs relate to the first research goal. RQ5 concerns cross-linguistic influence and therefore relates to the second goal of investigating the factors that

influence the acquisition of grammatical gender. Based on the findings relating to cross-linguistic influence in Greek-Dutch bilingual gender acquisition that Egger et al. (2018) reported, my predictions are the following: (i) there will be no cross-linguistic influence in the form of delay of gender discovery in Greek, and (ii) there will be cross-linguistic influence in the form of acceleration of gender discovery in Norwegian. The different learner gender defaults in Greek and Norwegian allow me to examine whether there is cross-linguistic influence in that domain. Specifically, I investigate whether the Greek-Norwegian bilinguals use the masculine gender in Greek and the neuter gender in Norwegian in an unexpected way. In this case, I predict that there will be no cross-linguistic influence in either gender default, because both defaults seem to develop early in gender acquisition (see Sections 2.2 and 2.4).

Finally, RQ6 regards some of the main factors that may contribute to bilingual Greek-Norwegian gender acquisition. Specifically, the study examines if (i) transparency, (ii) home language(s), (iii) age, (iv) literacy, (v) Greek schooling, and (vi) birth order influence the accuracy of gender agreement in real nouns. The first four factors concern both Greek and Norwegian gender acquisition, but the last two refer to Greek only. In addition to these factors, I check if there is a difference in grammatical gender accuracy between boys and girls.

The degree of transparency of a gender system has been found to influence bilingual gender acquisition (see Section 2.5). Therefore, I expect the following: (i) the Greek gender system develops at a fast pace due to its high degree of transparency, and (ii) the gender system in Norwegian is acquired slowly due to its opacity.

Furthermore, home language is used as a proxy to examine the potential role of the amount of input received in each language. Based on previous research findings (see Section 2.5), I predict the following: (i) children who are only or mainly exposed to Greek at home (group G) will be more accurate in the Greek gender agreement than the children who are exposed to more languages at home (group G+), and (ii) children in group G+ will not be more accurate in the Norwegian gender agreement than the children in group G. In other words, I expect an effect of the home language(s) on the minority language but not on the majority language.

Moreover, I investigate whether the amount of input received in each language over time affects the children's gender agreement accuracy in each language. To do that, I use the age of the children as a proxy based on the assumption that older children (above the age of 6) have been exposed to each language for a longer period of time than younger children (below the age of 6). Unsworth et al. (2014) found that current amount of input influences gender accuracy in Greek to a greater extent than age. Therefore, I anticipate that the older children's gender agreement scores may not be significantly more accurate than those of younger children in Greek. Additionally, Unsworth (2013) and Unsworth et al. (2014) found that amount of input over time significantly influences bilingual acquisition of Dutch gender. Since both Dutch and Norwegian have non-transparent gender systems, I predict that older Greek-Norwegian children will perform more accurately than younger children in the Norwegian gender agreement.

The next factor that I explore is literacy. As discussed in Section 2.5, Kaltsa et al. (2017) and Kaltsa et al. (2019) only found an effect of literacy on the Greek nonce nouns. Therefore, I expect that children who are literate in Greek will not be more accurate in Greek real noun gender agreement than illiterate children. To the best of my knowledge, the role of literacy in bilingual Norwegian gender acquisition has not been explored. Nevertheless, similarly to Greek, I hypothesize that there will be no difference between the two groups' performances in marking gender in Norwegian real nouns.

I also examine the role that Greek schooling may have on gender agreement accuracy in Greek. To my knowledge, previous research findings in the bilingual acquisition of Greek gender concern positive effects on the gender assignment and agreement accuracy with regards to nonce nouns only (see Section 2.5). Therefore, I predict that there will be no difference between the Greek gender agreement accuracy scores of children who receive Greek schooling and the scores of children who do not.

The final factor that I investigate is birth order. To do so, I compare the Greek gender agreement scores of first-born children and children without siblings to the scores of age-matched second- and third-born children. In this case, I hypothesise that birth order may affect the gender performance of Greek-Norwegian bilingual children in the minority language (Greek) as it has been documented to play a role in bilingual acquisition of other aspects of language (see Section 2.5).

3. Methodology

To identify the acquisitional patterns in Greek-Norwegian bilingual gender acquisition, I carried out two real noun elicited production experiments, one for Greek and one for Norwegian. This method allowed me to test the children's gender agreement accuracy rates in a controlled manner. The elicited data are comparable and offer an insight into the types of non-target-like use of nominal phrases. In this project, I also aim to investigate the children's ability to form predictions for unknown nouns and examine their notion of gender default. To accomplish this goal, I conducted two nonce noun elicited production experiments, one for Greek and one for Norwegian. The design of the nonce noun experiments was the same as the real noun elicited production experiment design. The experiments are simple and appear as a game that is entertaining for children. Also, they were successful in enabling observations of how children form gender predictions, and they were informative regarding the bilingual children's gender default in each of their languages. Finally, I designed and used a parental questionnaire to collect information concerning the children's and parents' or guardians' linguistic backgrounds.

The structure of this chapter is as follows. In Section 3.1, I discuss the real noun and the nonce noun elicited production experiments as well as the procedure followed in this study. In Section 3.2, I present the parental questionnaire. In Section 3.3, I introduce the participants and some relevant background information. The chapter ends with Section 3.4, where I describe the process of transcription.

3.1. Elicited production experiments and procedure

To achieve the aims of this project, I conducted two elicited production experiments in each language. The first experiment involved real nouns, while the second experiment involved nonce nouns. In both experiments, the indefinite form of the noun (indefinite article + noun) and the definite form of the noun (definite article/suffix + noun) were elicited. Each of these experiments is described and discussed in Sections 3.1.1-3.1.4. Finally, Section 3.1.5 refers to the observations made during the pilot testing of the experiments and the adjustments that were made to the material.

The data collection for this study took place during the Covid-19 pandemic, which demanded the following adjustments and compromises to be made to avoid the infection of the participants or myself. Firstly, the experiments were supposed to be carried out in two sessions (one for each language) with a 7-day interval. This was not feasible for all the participants because some tested positive for the virus after the first session and therefore, the second session needed to be delayed. As such, the sessions were conducted within a 7- to 9-day interval. Furthermore, both sessions were supposed to take place in person. After a sudden increase in the Covid-19 infection rates during the data collection five participants had to be tested online for the second time, and one participant completed both sessions online. The online procedure did not differ from the procedure followed when the testing took place in person. Manning et al. (2020) investigated the validity and reliability of language samples taken in person compared to language samples taken online and concluded that there was no significant difference between the

two. This conclusion indicates that online testing was a suitable alternative in this case.

In addition, the risk of infection made the recruitment of volunteers more difficult and time-consuming. To maximize participation, I tried to accommodate the needs of each family by meeting them in a space where they felt comfortable. This means that not all experiments were conducted under the same conditions. In most cases, testing took place in person either at the participant's home, a private group room in a library or university, or at the Greek Orthodox church in Oslo. In a few cases, the testing took place online. These adjustments mean that the quality of the recordings (e.g., background noise, echo, etc.) differs from one participant to another. The flexibility necessary to accommodate participants involved a lot of traveling; this made the data collection process longer since I could test up to two or three participants per day. Finally, it is worth noting that the pandemic had a psychological impact on people and essentially changed the ways of socialization. I noticed that many of the youngest children were not used to socializing outside the family or school. For this reason, it was challenging to form a connection with the youngest children in the sample so that they would not be too shy to perform the tasks. To ease this process, I used animal puppets to speak to the participants that were hesitant.

The order of languages was counter-balanced across the group, which means that in the first session, half of the children undertook the real noun and the nonce noun elicitation tasks in Greek while the other half undertook the real noun and the nonce noun elicitation tasks in Norwegian. Thereby, in the second session, the children participated in the elicitation tasks in the remaining language. In each of the two languages, the real noun experiment preceded the nonce noun experiment because it was easier for the children to understand the logic of the task when it involved real nouns and objects. Another reason why the nonce noun experiment followed the real noun experiment was to maintain the children's interest in the tasks. Specifically, I expected the nonce noun task to be somewhat challenging, especially for the youngest children; in other words, some children could lose interest in the task. Its difficulty could then result in the child's unwillingness to complete the real noun task afterwards. All experiments were recorded with a Panasonic RR-US430 digital voice recorder and were later digitally transcribed based on the recordings (see Section 3.4).

3.1.1. The real noun experiment in Greek

The materials I used in the real noun experiment were designed based on Rodina and Westergaard (2015b) and Van Baal (2020). Rodina and Westergaard (2015b) successfully used the picture-aided elicited production type of design in research with bilingual children, which made it suitable for the present project since both studies involve bilingual children in similar ages. Additionally, since Rodina and Westergaard (2015b), this design has been successfully used in other studies with monolingual children (Busterud et al., 2019; Rodina & Westergaard, 2015a) and it has become a common research design used to study grammatical gender acquisition in Norwegian. Van Baal (2020) modified Rodina and Westergaard's (2015b) material design in her research with adult heritage speakers of Norwegian to elicit indefinite and definite unmodified nominal phrases (article + noun) instead of indefinite and definite modified nominal phrases (article +

adjective + noun). This made Van Baal's (2020) modified design ideal for the experiments in this project.

The elicitation sequence for the Greek real noun experiment resembles the dialogue in (3.1). It is worth pointing out that the children were asked to start their responses with a given word or phrase before going through the practice items to limit non-target-like responses, such as the child only providing the noun without an article. On occasions where the article was omitted, I prompted the child to repeat their answer by starting with the appropriate word or phrase. This minimized article omission.

I used PowerPoint to create the material for all experiments in this study. All the pictures used in the real noun experiments were retrieved from openclipart.org which is an online, open-source clip-art database. There were two criteria for the picture selection. Firstly, each picture needed to clearly depict each object, so that the target nouns would be easily elicited. Secondly, the art style of the pictures needed to be appealing to the young participants of this study, which is why pictures in a cartoon style were selected.

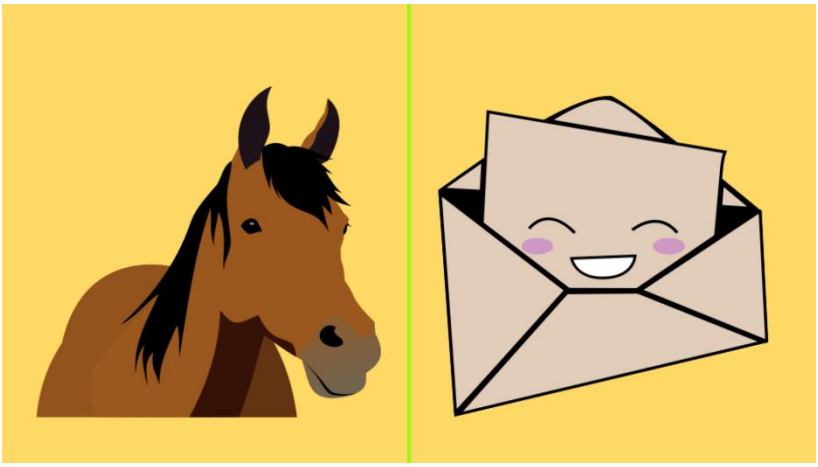


Figure 3.1: Example of real noun experiment screen used to elicit nominal phrases. The nouns, in this case, are 'horse' and 'letter' (*άλογο*, *àlogo* and *γράμμα, gràmma*)

(3.1) (Pictures of a horse and a letter shown simultaneously on the screen)

Experimenter:

Τi	βλέπεις	στην	οθόνη;
Tí	vlépis	stin	othóni
What	see.2SG.PRS	in.DEF	screen

'What do you see on the screen?'

Expected response:

Στην	οθόνη	βλέπω	ένα	άλογ-ο	και	ένα	γράμ-μα
Stin	othóni	vlépo	éna	alog-o	ke	éna	grám-ma
In.DEF	screen	see.1SG.PRS	INDF.N.SG.ACC	horse-N.SG.ACC	and	INDF.N.SG.ACC	letter-N.SG.ACC

'On the screen, I see a horse and a letter.'

(The picture of the horse disappears- the letter remains)

Experimenter:

Τί εξαφανίστηκε;
Tí eksafanístike?
What disappear.PASS.PST
'What disappeared?'
Expected response:
Εξαφανίστηκε το άλογ-ο.
Eksafanístike to álog-o
Disappear.PASS.PST DEF.N.SG.NOM horse-N.SG.NOM
'The horse disappeared.'
(Both pictures are shown again and now the letter disappears)
Experimenter:
Και τώρα τί εξαφανίστηκε;
Ke tóra tí eksafanístike?
And now what disappear.PASS.PST
'And what disappeared now?'
Expected response:
Εξαφανίστηκε το γράμ-μα.
Eksafanístike to grám-ma.
Disappear.PASS.PST DEF.N.SG.NOM letter-N.SG.NOM
'The letter disappeared.'

The nouns used in this experiment were chosen based on three criteria. The first criterion revolved around the noun endings. As discussed in Chapter 2, the inflection class system of the Greek language is extensive and its relationship to the gender system can be complex. For several reasons such as the time limitations of this project and the young age of the group involved, I felt that it would be unreasonable to include nouns of all possible inflection class and gender combinations while maintaining a sufficient number of nouns per category and without making the experiment very demanding. So, the noun endings *-ου (-ou)*, *-ες (-es),* and *-ους (-ous)* were excluded because they are concern a small number of nouns where gender is unambiguous. In addition, the experiment only contained masculine nouns ending in *-ος (-os)*, because most of the nouns found in the inflection class *-ος (-os)* are in fact masculine. Feminine nouns in this class are limited in number and thus, they form a closed class (Ralli, 2002; Varlokosta, 2011). Neuter nouns ending in *-ος (-os)* are also fewer in comparison to masculine nouns, and they were excluded from the present experiment because no items could meet the two other criteria for noun selection that were set for this study (see below).

The second criterion for noun selection was that the nouns needed to be easily and unambiguously depictable. As such, I tried to avoid the inclusion of nouns with a depiction that could elicit more than one noun. For example, the picture of a mouth could elicit the nouns mouth, lips, smile, teeth, tongue, etc. Thirdly, the nouns chosen had to be generally familiar to children in the 4-8 age group.[5] To make sure that this was the case, most of the nouns used in the experiment

[5] The experiments were designed for children aged 4-8 years even though the study included participants between 3;7 and 9;7 years.

belonged in the general categories of house items, food, animals, clothing, and vehicles. Additionally, many of the nouns had been previously used in research studies with bilingual children of similar age (e.g., Rodina & Westergaard, 2015b). The full list of the nouns used in the Greek real noun experiment can be found in Appendix A.

This experiment contained 28 nouns in total, 4 of which were practice items that encompassed the first two slides of the experiment. The practice nouns contained 1 masculine, 1 feminine, and 2 neuter nouns. Two slides were considered adequate for practice and therefore, the distribution among genders could not be equal. Thus, I chose to include 2 neuter nouns because neuter is the most common gender in child-directed speech as well as early child speech in Greek (Stephany & Christofidou, 2008). The 24 test nouns were equally distributed between the most typical noun endings of each of the three grammatical genders. Specifically, the test items consisted of 9 masculine nouns, 6 feminine nouns, and 9 neuter nouns. The masculine and neuter nouns were equally distributed among three noun endings for each gender, respectively. Namely, the experiment involved 3 masculine nouns ending in *-ος (-os)*, 3 masculine nouns ending in *-ας (-as),* and 3 masculine nouns ending in *-ης (-is)*. It also involved 3 neuter nouns ending in *-ο (-o)*, 3 neuter nouns ending in *-ι (-i),* and 3 neuter nouns ending in *-μα (-ma)*. To reduce the demand of the experiment, nouns that belong to only two of the feminine noun endings were included, which meant that the number of the feminine nouns included in the experiment was slightly unequal to the number of masculine or neuter nouns. Precisely, 3 feminine nouns ending in *-α (-a)* and 3 feminine nouns ending in *-η (-i)* were selected.

All the slides for the experiments were designed so that only nouns with different grammatical genders or different noun endings appeared on the same slide. This was done to avoid the creation of a predictable pattern that could potentially lead to habitual responses (e.g., the left object being often neuter). Similarly, the order in which the object disappeared in each slide was random.

3.1.2. The real noun experiment in Norwegian

The procedure followed in the Norwegian version of the real noun experiment was the same as for Greek except for the fact that in the Norwegian experiment, the children were not asked to start their response with a specific word in the definite condition. This is because it is not grammatical to start a sentence with a verb in Norwegian. The elicitation sequence resembles the dialogue in (3.2).

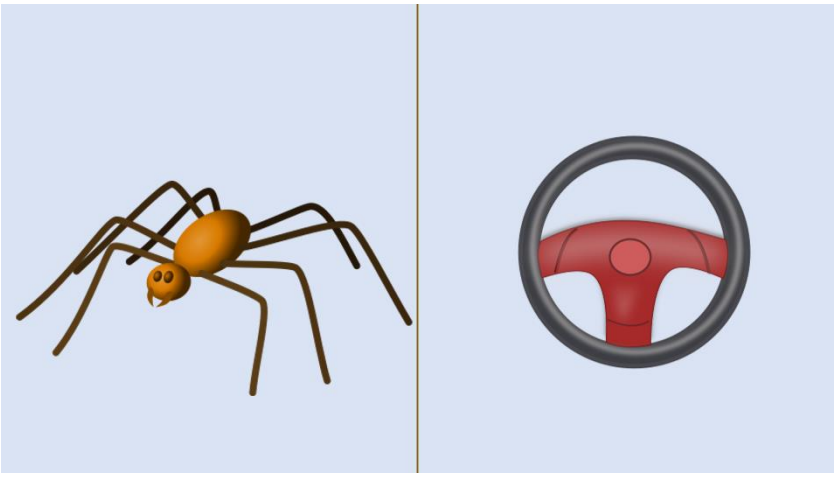


Figure 3.2: Example of real noun experiment screen used to elicit nominal phrases. The nouns, in this case, are 'spider' and 'steering wheel' (*edderkopp* and *ratt*)

(3.2) (Pictures of a spider and a steering wheel shown simultaneously on the screen)

Experimenter:

Hva	ser	du	på	skjermen?
What	see.PRS	you.2SG	on	screen.DEF.SG

'What do you see on the screen?'

Expected response:

På	skjermen	ser	jeg	en	edderkopp	og	et	ratt.
On	screen.DEF.SG	see.PRS	I.1SG	INDF.M.SG	spider.M.SG	and	INDF.N.SG	steering wheel.N.SG

'On the screen, I see a spider and a steering wheel.'

(The picture of the steering wheel disappears- the spider remains)

Experimenter:

Hva	forsvant?
What	disappear.PASS.PST

'What disappeared?'

Expected response:

ratt-et
steering wheel-DEF.SG
'The steering wheel.'

(Both pictures are shown again and now the spider disappears)

Experimenter:

Hva	forsvant	nå?
What	disappear.PASSS.PST	now?

'What disappeared now?'

Expected response:

edderkopp-en
spider-DEF.SG
'The spider.'

The selection of nouns for the Norwegian real noun experiment followed the same criteria as the Greek experiment. That is, the nouns needed to be unambiguously depictable and familiar to children aged 4-8 years. Again, to ensure that this is the case, the nouns chosen were mostly everyday life objects such as food, clothing, or animals. Many of the nouns chosen for the experiment had also been previously used in research with children that belonged to similar age groups (Rodina & Westergaard, 2015b). Most (17 of the 24) test items were nouns that had also been used in the Greek version of the experiment. The remaining 7 nouns differed in Norwegian to create balance among the three genders. A complete list of the Norwegian nouns used in this experiment can be found in Appendix A.

As discussed in Chapter 2, several Norwegian dialects are undergoing loss of the feminine gender (see Section 2.2.2). This loss is most prominent in the feminine indefinite article *ei* which is replaced by the masculine indefinite article *en* especially by young children. However, this is not the case for the feminine definite suffix *-a* which is in most cases retained. For this reason, and for the fact that the bilingual children in this study came from different locations in Norway and thus spoke different dialects, the study included nouns belonging to all 3 genders. This also provided the opportunity to explore the loss of the feminine gender in bilingual children. Similar to the Greek version, the Norwegian real noun experiment consisted of 28 nouns, out of which 4 were practice items that were used in the first two slides to make sure that the children had understood the task. The practice items involved 2 masculine, 1 feminine, and 1 neuter noun. In this case, I chose to include 2 masculine nouns because masculine is the most frequent gender in Norwegian (Busterud et al., 2019). The remaining 24 nouns were equally distributed between the three genders since noun endings in Norwegian do not convey morphophonological gender cues in the same way that Greek nouns endings do (see Section 2.2.2). Therefore, the experiment included 8 masculine, 8 feminine, and 8 neuter nouns.

As far as the experiment material is concerned, approximately one third of the pictures of nouns that were common between the Greek and the Norwegian real noun experiments were replaced by different pictures which depicted the same objects slightly differently. For example, in the Greek experiment material the apple is red while it is green in the Norwegian material. This change made the material more engaging for the children during the second testing session since it differed to some extent from the first session.

3.1.3. The nonce noun experiment in Greek

The experimental design for the nonce noun tasks resembled that of the real noun experiments. However, this time the slides depicted objects that were unfamiliar, and therefore it was unlikely that the children would be able to name them (see Figure 3.3). All pictures used in the nonce noun experiments were retrieved from the *Novel Object and Unusual Name* database (NOUN) (Horst & Hout, 2016). To introduce the task, I provided the children with a short story about a friendly alien that came from another planet and brought many cool, yet unknown objects which he kept in his spaceship. This brief introduction made the children curious and engaged in the nonce noun task. The children were again shown two pictures of two different objects on a computer screen. Since the

objects were unknown this time, I first introduced the names of the two objects and then asked the child to repeat the nonce nouns, before I repeated them one last time. This aimed to increase the chances of the child remembering the novel nouns throughout each individual sequence. The elicitation sequence resembles the dialogue in (3.3).

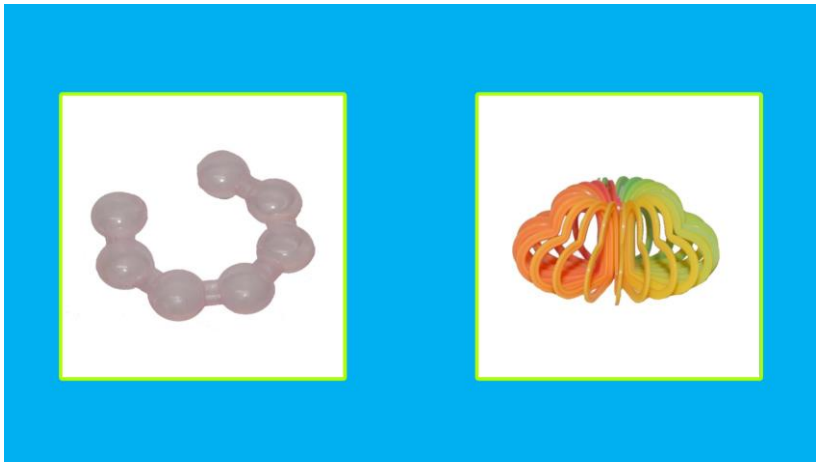


Figure 3.3: Example of nonce noun experiment screen used to elicit nominal phrases. The nonce nouns, in this case, are *γοργιά*, *gorgiá* and *βακτιτής*, *vaktitís*.

(3.3) (Pictures of two novel objects are shown simultaneously on the screen)

Experimenter:

Τί	βλέπεις	στην	οθόνη;
Tí	vlépis	stin	othóni
What	see.2PRS	in.DEF	screen

'What do you see on the screen?'

Expected response:

Στην	οθόνη	βλέπω	μία	γοργι-ά	και	έναν	βακτιτ-ή
Stin	othóni	vlépo	mía	gorgi-á	ke	énan	vaktit-í
In.DEF	screen	see.1PRS	INDF.F.SG	gorgia-F.SG.ACC	and	INDF.M.SG	vaktiti-M.SG.ACC

'On the screen, I see a gorgia and a vaktitis.'

(The gorgia disappears- the vaktitis remains)

Experimenter:

Τί	εξαφανίστηκε;
Tí	eksafanístike?
What	disappear.PASS.PST

'What disappeared?'

Expected response:

Εξαφανίστηκε	η	γοργι-ά.
Eksafanístike	i	gorgi-á
Disappear.PASS.PST	DEF.F.SG	gorgia-F.SG

'The gorgia disappeared.'

(Both pictures are shown again and now the vaktitis disappears)

Experimenter:

Και	τώρα	τί	εξαφανίστηκε;
Ke	tóra	ti	eksafanístike?

And now what disappear.PASS.PST
'And what disappeared now?'
Expected response:

Εξαφανίστηκε	ο	βακτιτ-ής.
Eksafanístike	o	vaktit-ís.
Disappear-PASS.PST	DEF.M.SG	vaktitis-M.SG

'The vaktitis disappeared.'

Similar to the real noun experiment, the nonce noun experiment consisted of 28 nouns, 4 of which were practice items that appeared in the first two slides to ensure that the participant had understood the task. All nonce nouns used in the Greek experiment can be found in Appendix B. The practice nouns involved 1 masculine, 1 feminine, and 2 neuter nonce nouns that I created. The test nonce nouns were distributed in the same way as the real nouns. That is, the experiment included 3 nonce nouns per each noun ending used in the real noun experiment. Most nouns (14 of the 24) used in the experiment were created by me and 10 nouns were taken from Varlokosta (2005) (also used in Varlokosta (2011) and Karayiannis et al. (2021)), as indicated in Appendix B. These nouns consisted of different numbers of syllables (2, 3 and 4 syllables) and stress patterns (stress on the ultimate, penultimate, or antepenultimate syllable) to represent the syllable and stress variation that is found in real Greek nouns.

Some previous nonce noun experiments in Greek (Kaltsa et al., 2017; Kaltsa et al., 2019; Prentza et al., 2019), used nonce nouns that were separated from real nouns only by a single phoneme. As discussed in Chapter 2, this may influence the participants' gender preferences. To minimize this, the criteria for the noun creation in this master's thesis were stricter and similar to those that Varlokosta (2005, 2011) and Karayiannis et al. (2021) follow. Specifically, most nonce nouns consisting of 2 syllables and all nonce nouns consisting of 3 and 4 syllables included in this experiment had at least 2 or more phonemes separating them from existing nouns.

3.1.4. The nonce noun experiment in Norwegian

The design of the nonce noun experiment in Norwegian was very similar to the Greek one. As in the Greek nonce noun task, a brief introductory story about a friendly alien that had come to Earth from another planet bringing many interesting objects in his spaceship was used to introduce the task. To make the task a bit more interesting, I made sure that the alien and the background differed from those used in the Greek task. Additionally, all the novel object pictures were different from the ones used in the Greek task. This was partially done to avoid cases where the participant could remember the name of an object from the first nonce task, which could either lead to them producing the nonce noun from the first nonce task or influence their gender choice.

The elicitation process is the same as the one in the Greek nonce task which was described in the previous section. The elicitation sequence for the Norwegian nonce task resembles the dialogue in (3.4).

Figure 3.4: Example of nonce noun experiment screen used to elicit nominal phrases. The nonce nouns, in this case, are *glyv* and *kvumme*.

(3.4) (Pictures of two novel objects are shown simultaneously on the screen)

Experimenter:

Hva	ser	du	på	skjermen?
What	see.PRS	you.2SG	on	screen.DEF.SG

'What do you see on the screen?'

Expected response:

På	skjermen	ser	jeg	en	glyv	og	en	kvumme
On	screen.DEF.SG	see.PRS	I.1SG	INDF.M.SG	glyv.N.SG	and	INDF.M.SG	kvumme.F.SG

'On the screen, I see a glyv and a kvumme.'

(The picture of the kvumme disappears- the glyv remains)

Experimenter:

Hva	forsvant?
What	disappear.PASS.PST

'What disappeared?'

Expected response:

kvumm-en

kvumma-DEF.SG

'The kvumme.'

(Both pictures are shown again and now the glyv disappears)

Experimenter:

Hva	forsvant	nå?
What	disappear.PASS.PST	now?

'What disappeared now?'

Expected response:

glyv-en

glyv-DEF.SG

'The glyv.'

The Norwegian nonce noun experiment also consisted of 28 nouns in total, 4 of which were practice items in the first two slides of the experiment. All of the nonce nouns used in this experiment were taken from Urek et al. (2022), who conducted nonce noun experiments with adult Norwegian monolinguals. The nonce nouns in Urek et al. (2022) were divided into three conditions: the

common, the feminine, and the neuter. The common condition included monosyllabic nouns. The feminine condition consisted of disyllabic nouns that ended in *-e*. The neuter condition involved monosyllabic nouns that ended in *-v*. These conditions were created to test the predictive values of the noun endings *-v* and *-e*. The noun ending *-e* has been argued to predict the feminine gender value (Trosterud, 2001), whereas the noun ending *-v* has been found to predict the neuter gender value (Urek et al., 2022). The present study used the same nouns to investigate whether Greek-Norwegian bilingual children will perform similar to the adults in Urek et al. (2022) or the Norwegian monolingual children in Gagliardi (2012). For this experiment, I used 8 nonce nouns of each of the three nonce noun categories.

3.1.5. Pilot testing: observations and adjustments

To ensure that the elicited production tasks worked as intended, an unofficial pilot test was conducted with three adult native speakers of Greek and three adult native speakers of Norwegian. The pilot test was not recorded since its purpose was not the analysis of the linguistic data. Rather, the pilot test was carried out to ensure that the pictures would elicit the intended nouns and to evaluate how demanding the entire procedure and especially the nonce noun task were. As far as the Greek real noun task is concerned, all pictures except for the crown picture elicited the expected nouns. In the case of the crown picture, two of the participants used the expected noun *στέμμα (stémma,* 'crown'*)* while the other produced the noun *κορώνα (koróna,* 'crown'*)*, which can also be used to describe the object. However, since there are not many nouns that end in *-μα (-ma)* and fulfil the noun selection criteria described in Section 3.1.1, the item was not replaced. Moreover, in the Norwegian real noun task, all pictures, except for the computer picture elicited the target nouns. The computer picture elicited the target noun *datamaskin* ('computer') from one speaker, but the noun *PC* ('computer') from the other two speakers. However, the noun was not replaced since both nouns have the same gender in Bokmål.

Additionally, during pilot testing, I observed that the nonce experiment was mentally challenging for the adult monolingual speakers in both languages. In the Greek nonce noun task, the adult monolinguals experienced difficulty in remembering the nonce nouns, even after I repeated them. However, I noticed that they had less difficulty recalling the Greek nonce nouns that consisted of 2 syllables. Therefore, some of the nouns consisting of 3 and 4 syllables were replaced by disyllabic nouns even though nouns consisting of 3 or 4 syllables are not uncommon in Greek. Furthermore, it is worth noting that both the Greek and the Norwegian adults often forgot or slightly altered the nonce nouns during a single sequence. Also, I noticed that they had increasingly higher difficulty remembering the new nonce nouns since they sometimes used nonce nouns from previous slides. To cope with the noun recollection problem, I chose to repeat the nouns on occasions when the participant had trouble remembering. When the experiment was conducted with the bilingual children, I instructed them to ask me to repeat the nouns when they could not remember them. Finally, these observations showed that this was a mentally demanding process for adult monolinguals, which implied that it would probably be (more) challenging for bilingual children. To make the process more manageable for the bilingual children, the test items in both the real and the nonce noun tasks were reduced

from 28 to 24 in the final experiment material described in the previous sections. This is a rather small adjustment but reducing the number of nouns per noun ending even more would affect the statistical validity and reliability of the results.

3.2. Parental questionnaire

For the purposes of this project, a parental questionnaire was the most time- and cost-efficient method of collecting information regarding each bilingual child's language environment. One of the advantages of this method is the fact that it has been effectively used in similar research studies on bilingual language acquisition (e.g., Egger et al., 2018; Kaltsa et al., 2017; Rodina & Westergaard, 2015b). Moreover, Gutiérrez–Clellen and Kreiter (2003) investigated the efficiency of parental reports in determining the bilingual status of their children and concluded that parental questionnaires are a reliable and valid tool for this purpose. In other words, it has been demonstrated that parents often have a satisfactory overview of their children's language exposure, habits, and literacy skills to adequately provide information concerning the variables in question. As the children themselves are too young to answer these questions, the use of parental questionnaires was probably the best option in this case.

Previous studies on bilingual gender acquisition (e.g., Kaltsa et al., 2019; Mitrofanova et al., 2018) have either used standardized questionnaires such as the BiLEC or the PABIQ or more detailed questionnaires that were developed for large-scale projects. Indeed, these standardized questionnaires add to the validity and reliability of the research since they have been tested and proven to be effective in the collection of background information. However, while standardized questionnaires may be necessary for large-scale studies that consider multiple variables and investigate multiple factors in-depth, it does not mean that they are suitable for a smaller-scale research project such as this. By creating a custom parental questionnaire for this study, the parents did not have to fill out a very lengthy and detailed questionnaire that provides information which would eventually not be used. This also eliminated the ethical concerns of collecting more information than I intend to use while it also increased the chances of convincing volunteers to participate since most people would be more willing to fill out a shorter questionnaire.

Therefore, I created a parental questionnaire to collect background information about the participants and their parents.[6] The first part of the questionnaire included questions about the age and gender of the children, the languages of schooling, the languages spoken at home, and their literacy skills in each language. These questions were formulated in a manner that would permit the collection of background information in cases where the children were trilingual or quadrilingual. Moreover, the second part of the questionnaire included questions about the parents, guardians, or caregivers (e.g., babysitter, grandparent, aunt, uncle, etc.) that the child spends time with regularly. These questions concerned the parent's level of education, the languages that they speak, and the languages they use with the child. The questionnaire included the parental set of questions four times to accommodate cases where the child spends time with more than

[6] For ease of exposition, I use the word *parents* to refer to parents, guardians, or caretakers across the thesis.

two parents or caregivers. For instance, a child may also spend time with stepparents, grandparents, relatives, babysitters, etc. The collection of information about the people with whom the child spends time regularly provided a more complete picture of the child's usual language exposure as well as information about the homogeneity of the sample.

The questionnaire took approximately ten minutes to fill out and the parents either filled it in at home and brought it to the first testing session or sent it to me via email. Some parents filled out the questionnaire during the first testing session. The parents were also told that they could contact me while filling out the questionnaire if they needed clarifications or had questions. The questionnaire was available in Greek and Norwegian so that the parents could fill it out in their preferred language. Additionally, this enabled the involvement of both parents in the cases where one parent was a native speaker of Greek and the other parent was a native speaker of Norwegian.

3.3. Participants

A total of 25 participants aged between 3;07 and 9;07 were recruited for the present study. However, 3 of the participants were excluded because they did not complete the experiments in one of the two languages. Furthermore, 3 children did not manage to do the nonce task in either of the two languages or only provided a couple of responses in only one of the languages. These children were excluded from the nonce task analysis. This means that the final sample for the real noun task consists of 22 children (10 girls and 12 boys), while the final sample for the nonce noun task consists of 19 children (8 girls and 11 boys).

As reported in the parental questionnaire, 17 of the participants were bilingual, 3 were trilingual (Greek, Norwegian and 1 additional language) and 2 were quadrilingual (Greek, Norwegian and 2 additional languages). The additional languages of the multilingual children do not have grammatical gender. All participants except for two were exposed to both languages before the age of 3 and are therefore considered simultaneous bilinguals. Moreover, the group could be divided into 11 children who are exposed to solely or mainly Greek at home (G group) and 11 children who are exposed to more than one language at home (G+ group). Furthermore, 12 participants were not literate in either language because of their age, 5 were literate only in Norwegian, and the remaining 5 were literate in both languages. In addition, 10 participants attended Greek lessons for 1 to 2 hours a week (5 of those were literate in both languages and 5 were illiterate).

The recruitment of participants for this project was mainly done through social media groups that consist of Greek expatriates in Norway and through the Greek Orthodox Church in Oslo. Most of the participants that were recruited for this project resided in Oslo or smaller cities in the Viken county (e.g, Sandvika, Fredrikstad, Lørenskog, etc.), whereas a few of the participants resided in Trondheim. This entailed traveling to Oslo and other cities to test participants that did not live in Trondheim. Therefore, the data collection started on 14 November 2021 and was completed on 22 December 2021.

3.4. Transcription

The nominal phrases were transcribed at an orthographic level in both languages. All the recordings were transcribed by me, a native speaker of Greek, but an upper intermediate speaker of Norwegian, which means that my skills in transcribing Greek and Norwegian are naturally not equal. Therefore, instances where an article or noun ending was inaudible as well as instances where there was a high degree of uncertainty as to what the participant said were excluded. Additionally, I excluded items where I accidentally provided the entire noun or gave a gender cue as well as the items where the parent of the child intervened (e.g., by providing the article of the noun to help the child). Moreover, diminutives, determiners, plural forms, or code-switches were also excluded from the data analysis as were the occasions where a real noun was used in the nonce task. Finally, in a few instances, the child changed the noun ending of the Greek real noun to fit the gender of the article that the child produced. These were also excluded.

During the transcription process, decisions concerning the participant inclusion criteria were also made. Firstly, the basic participant inclusion criterion was that the participant has gone through at least half of the real noun task in both languages. This does not mean that a participant had to have produced at least 12 nominal phrases since there were cases where less than half of the nouns were elicited even though the participant went through the entire task. The criterion means that the participant must have completed at least half of the real noun task, irrespective of how many nominal phrases were elicited in that half of the task. Because of the challenges present in the nonce noun task (see Section 3.4), the data was limited and for this reason, the basic inclusion criterion was different in this case. Specifically, the basic inclusion criterion, for the nonce task was set so as to maximize the inclusion of participants and enable the use of as much data as possible. This decision was made because this type of study has not been conducted with Greek-Norwegian bilingual children before.

4. Results

The previous chapter described the elicited production tasks as well as the testing procedure. In this chapter, the results of the elicited production tasks are presented. All the responses elicited are categorized into target-like nominal phrases and non-target-like nominal phrases for the data analysis of the real noun experiments. There are two subcategories within the non-target-like nominal phrase category: (i) non-target-like agreement and (ii) omitted article/suffix. These two subcategories of non-target-like behavior are discussed in detail in this chapter. The participants rarely used indefinite forms in the definite condition and vice versa, so these instances are only briefly mentioned. For the data analysis of the nonce noun experiment, the responses are categorized into three categories: (i) expected nominal phrases, (ii) unexpected nominal phrases, and (iii) nominal phrases with omitted article/suffix. I use the term gender agreement when discussing whether children produce the target-like article or suffix with real nouns. Since nonce nouns do not have an assigned gender value but rather an expected assigned value, I use the term gender assignment when I examine whether children produce the expected article or suffix with nonce nouns. Finally, all of the data in this study are not normally distributed, and therefore, the paired Wilcoxon test and the non-paired two-sample Wilcoxon test were used for the data comparison (the Shapiro-Wilk normality test results are found in Appendix F).

The following decisions were made regarding how the data are analyzed. For Norwegian neuter nouns that end in *-e* in the bare form, it is not possible to hear whether they contain the definite suffix *-et* because that is also pronounced /-e/. Nevertheless, I chose to analyze them as target-like definite neuter forms. In the definite condition, the use of both feminine and masculine definite suffixes was classified as target-like for traditionally feminine nouns. When the masculine definite suffix was used with a feminine noun, it was counted as a target-like masculine noun. In addition, many children consistently used the nominative case instead of the accusative in the indefinite condition of the Greek experiments and 2 children used the accusative case form (*τη (ti)*) of the feminine definite article instead of the nominative (*η (i)*) in the definite condition of Greek feminine nouns. I analyzed these kinds of responses as target-like or non-target-like based on gender agreement and ignored case accuracy. In instances where the participant provided the same noun for two different pictures (e.g., using the noun 'paper' when shown both the map and the letter pictures), the noun is counted both times. This implies that when an unexpected noun was elicited, the noun is counted according to its gender and its noun ending for Greek. Finally, when a participant altered the noun ending of a nonce noun, the nonce noun was analyzed based on the noun ending given by the participant.

The results from the four tasks are presented in the following order: Greek real noun task (Section 4.1), Norwegian real noun task (Section 4.2), Greek nonce noun task (Section 4.3), and Norwegian nonce noun task (Section 4.4). In each section, the results for the indefinite condition precede the results for the definite condition. In Section 4.5, I compare the Greek and the Norwegian results. In Section 4.6, I discuss the contribution of each factor I investigated.

4.1. Real noun experiment in Greek

In the indefinite condition of the Greek real noun experiment, a total of 403 responses were elicited. However, the indefinite article is omitted in 20.10% (81/403) of all the nominal phrases elicited. It is worth noting that the participants omit the indefinite article almost equally in all 3 genders. The mean omission is 27.56% (SD= 35.858), which is relatively high, and there is much inter-speaker variation. In fact, the range of the omission rates is 0-100%. Nonetheless, only 3 participants omit the article 100% of the time, whereas 10 participants rarely or never omit the indefinite article. Interestingly, the participants who always omit the indefinite article are aged 4;6, or younger and produced a relatively low number of nouns (15/24 or fewer), while most participants (n=9) that rarely or never omit the indefinite article are aged 6;2 or older.

When we look at the indefinite articles produced, the overall accuracy of gender agreement is 82.81% (265/320). Table 4.1 presents the accuracy of gender agreement on all nouns as well as for each gender (M, F, N). As shown in the table, most participants demonstrate high gender agreement accuracy rates although gender is not entirely in place for most children yet. Only 7 participants score above 90% in the overall gender agreement and can therefore be said to master the Greek gender agreement.[7] Interestingly, most of them (n=6) have only Greek as their home language and they are all the only or first-born child in the family. These factors may contribute to the acquisition of gender agreement (see Section 4.6 for more).

	Mean	SD	Range	Number > 90%
All nouns	81.39 %	18.911	41.67-100%	8
M	46.92 %	45.415	0-100%	6
F	83.89 %	33.805	0-100%	14
N	99.42 %	2.549	88.89-100%	18

Table 4.1: Accuracy of gender agreement in the Greek indefinite condition

Furthermore, Table 4.1 shows that participants demonstrate the highest agreement accuracy rates in the neuter, followed by the feminine and then the masculine gender. This is seen in the mean scores and the number of children with accuracy scores over 90%. In the masculine gender, 7 participants have an accuracy score of 0%, while only 2 participants score 0% for feminine. However, all participants except 1 score 100% in the neuter agreement.[8]

The total accuracy of agreement in the neuter gender is 99.20% (124/125) with a mean score of 99.42% (SD=2.549). As such, it is obvious that the neuter gender is in place essentially in all the children who produced indefinite articles.

The total accuracy of agreement in the feminine gender is 89.01% (81/91), and the mean accuracy score is 83.89% (SD=33.805). In this case, 14 participants score 100%. Unsurprisingly, they also score 100% in the neuter gender.

[7] There are 8 children that score above 90%, but 1 of the scores is inflated because the participant produced only 1 nominal phrase which happened to be accurate.
[8] The participant that scored 88.89% was uncertain about the form of 1 noun. If that item is excluded, the participant's score would be 100%.

Interestingly, most participants (n=5) who have not yet acquired the feminine are exposed to more languages than Greek at home.

The total accuracy of agreement in the masculine gender is 57.69% (60/104), and the mean score is 46.92% (see Table 4.1). This indicates that the masculine gender is not yet in place for many of the children in this sample. Only 6 participants have an accuracy score of over 90%[9], while 7 participants have an accuracy score of 0%. It is not surprising to see that all of them also score 100% both in the neuter and the feminine gender agreement. Interestingly, most (n=6) children that score 0% in the masculine agreement are second- or third-born children.

In all cases of non-target-like agreement, the neuter indefinite article is used, as in examples (4.1) and (4.2). This suggests that neuter is the Greek gender default for these Greek-Norwegian bilinguals, just like in Greek monolinguals (see Sections 2.2.1 and 2.4). As it may be expected due to the syncretism in the Greek nominal paradigm (see Section 2.2.1), the non-target-like agreement is predominantly observed in masculine nouns ending in *-ας (-as)* and *-ος (-os)*, but less so in nouns ending in *-ης (-is)*. To a lesser extent, some non-target agreement is also observed in feminine nouns ending both in *-α (-a)* and *-η (-i)*.

(4.1)

Observed response (P06):		Target-like response:	
Ένα	τηλεόρασ-η	Μία	τηλεόρασ-η
Èna	tileòras-i	Mìa	tileòras-i
INDF.N.SG	tv-F.SG	INDF.F.SG	tv-F.SG
‘A tv’		‘A tv’	

(4.2)

Observed response (P05):		Target-like response:	
Ένα	ελέφαντ-ας	Ένας	ελέφαντ-ας
Èna	elèfant-as	Ènas	elèfant-as
INDF.N.SG	elephant-M.SG	INDF.M.SG	elephant-M.SG
‘An elephant’		‘An elephant’	

In the definite condition of the Greek real noun experiment, there was a total of 395 responses. The total percentage of article omission is 26.84% (106/395), while the mean rate of omission is 35.99% (SD= 40.932, range: 0-100%). The definite article is omitted equally across the 3 genders. When we look at the omission rates, we see that many participants omit the definite article at least some of the time, while 4 participants omit the definite article 100% of the time. Most of them (n=3) have omission scores of 100% in the indefinite condition, too. In addition, there is no statistically significant difference between the indefinite and definite conditions with respect to the omission of articles (paired Wilcoxon test: V=27, p=0.2084). This means that the participants do not omit articles significantly more in one of the two conditions.

When it comes to the definite articles, the total accuracy of gender agreement is 89.02% (235/264). Table 4.2 presents the accuracy of gender agreement on all

[9] There is 1 child who scores 87.50% (7/8) in the masculine which suggests that she has also acquired the masculine.

nouns as well as for each gender (M, F, N). As seen in Table 4.2, many children have a relatively high accuracy of overall gender agreement. This suggests that many children have (nearly) acquired gender in Greek. As in the indefinite condition, the highest agreement accuracy in the definite condition is found in the neuter, followed by the feminine and then the masculine gender. In the masculine gender, 5 participants score 0%, whereas in the feminine only 1 child scores 0%. In the neuter gender, all participants have a score of over 90%. These scores are in line with the scores in the indefinite condition, which shows the following: (i) the neuter gender is in place in all the participants that produced articles, (ii) the feminine gender has been nearly acquired by most participants, and (iii) the masculine gender has been acquired by some participants, while some show no knowledge of it.

	Mean	**SD**	**Range**	**Number > 90**
All nouns	88.11 %	17.251	55.56-100%	11
M	63.39 %	49.143	0-100%	8
F	87.84 %	28.209	0-100%	13
N	99.43 %	2.273	90.91-100%	16

Table 4.2: Accuracy of gender agreement in the Greek definite condition

Similar to the indefinite condition, in all cases of non-target-like agreement the neuter definite article is used (see (4.3) and (4.4)). This is a further indication that neuter is the Greek gender default also for these bilingual children. Additionally, the non-target-like agreement is mainly observed in masculine nouns ending in *-ας (-as)* but much less so in nouns ending in *-ος (-os)*, and *-ης (-is)*. To a lesser extent, some non-target-like agreement is also seen in feminine nouns ending in *-η (-i)* and *-α (-a)*.

(4.3) Observed response (P04): Target-like response:

Το	καρέκλ-α	Η	καρέκλ-α
To	karèkl-a	I	karèkl-a
DEF.N.SG	chair-F.SG	DEF.F.SG	chair-F.SG
'The chair'		'The chair'	

(4.4.) Observed response (P20): Target-like response:

Το	βάτραχ-ος	Ο	βάτραχ-ος
To	vàtrah-os	O	vàtrah-os
DEF.N.SG	frog-M.SG	DEF.M.SG	frog-M.SG
'The frog'		'The frog'	

Lastly, in this condition, some semantically non-target-like behavior is also observed. Specifically, 1 participant consistently used indefinite articles in the definite condition, while 3 more participants did the same in one or two test items.

There is a statistically significant difference between the overall gender agreement accuracy scores in the indefinite and the definite condition (paired Wilcoxon test: V=3, p=0.009719). This means that the children perform significantly more accurately in the definite condition. However, there is no statistically significant difference between the indefinite and definite gender

agreement in the masculine (paired Wilcoxon test: V=6, p=0.4017), feminine (paired Wilcoxon test: V=1.5, p=0.2693), or neuter gender (Paired Wilcoxon test: V=1, p=1). Comparing Tables 4.1 and 4.2, there seems to be a difference in the masculine gender as the mean score is a lot higher in the definite condition, but this was not confirmed in the statistical test. However, the large variation (seen in the high SDs) may be a reason why the result was not significant when the masculine was tested separately.

4.2. Real noun experiment in Norwegian

In the indefinite condition of the Norwegian real noun experiment, a total of 466 responses were elicited. The article is omitted in 14.81% (69/466) of them. The omission of indefinite articles is equal across genders. Furthermore, the mean omission of indefinite articles is 15.98% (SD=25.330). The large SD shows that there is much variation in the sample regarding the omission of indefinite articles. Even though the range of omission scores is 0-91.67%, only 1 participant omits the article above 90% of the time, whereas 13 participants rarely or never omit it. It is worth noting that all participants who rarely or never omit the indefinite article are aged 4;9 or older, and most of them (n=11) are aged 5;10 or older. This indicates that most Greek-Norwegian bilingual children start using the indefinite article in Norwegian consistently around the age of 6.

For the indefinite articles that were elicited, the overall accuracy of agreement is 87.88% (348/396). In Table 4.3, the accuracy of gender agreement on all nouns as well as for each gender (M, F, N) is presented. As seen in the table, the mean accuracy of agreement on all nouns is 86.86% (SD=13.534), which means that most participants score high in the overall agreement, though only 9 can be argued to master the indefinite gender agreement in Norwegian.[10] Age may be an important factor in this case since most children (n=8) with a high accuracy score are aged 6;2 or above. It is worth mentioning that Rodina and Westergaard (2015a) have shown that due to the slow acquisition of the neuter, the gender system in Norwegian is not in place until approximately age 7 in monolinguals.

	Mean	**SD**	**Range**	**Number > 90**
All nouns	86.86 %	13.534	66.67-100%	12
M	97.93 %	5.862	77.78-100%	20
F	n/a	n/a	n/a	n/a
N	57.13 %	44.409	0-100%	8

Table 4.3: Accuracy of gender agreement in the Norwegian indefinite condition

Overall, Table 4.3 shows that the children demonstrate the highest accuracy of agreement scores in the masculine, while much lower scores can be observed in the neuter gender. It is also worth noting that none of the children produced the feminine indefinite article *ei*. With all nouns where *ei* could have been used, *en* (M) was used instead, which confirms previous findings on the loss of the feminine gender in Norwegian (see Section 2.2.2).

The total accuracy of agreement in the masculine gender is 98.15% (266/271), with the mean score being 97.93% (SD=5.862). This suggests that the masculine

[10] There were 12 children who scored above 90%, but 2 of the scores are inflated because the participants produced very few nominal phrases.

is in place for nearly all children in the sample as 20 participants have accuracy scores above 90%[11], while the two participants that score below 90% still have relatively high scores (77.78% and 83.33%).

When it comes to the neuter gender, the total accuracy of agreement is 65.60% (82/125), with the mean score being 57.13 % (SD=44.409) The large SD and range of scores imply that there is much variation in the sample. Specifically, some participants (n=9)[12] seem to have acquired the indefinite neuter agreement in Norwegian, while other participants (n=6) do not use the neuter indefinite article at all. Notably, most children (n=8) that score very high on neuter agreement are aged 6;2 or older.

When we look at the non-target-like agreement, most children consistently used the masculine indefinite article with neuter nouns as in (4.5). However, 3 participants also used the neuter indefinite article with masculine nouns (see (4.6)) approximately as frequently as they used the masculine article with neuter nouns. This suggests that masculine is the Norwegian gender default for Greek-Norwegian bilinguals, though there may be signs of cross-linguistic influence in some children who were exposed to Norwegian after the age of 3 and for whom Greek may be the dominant language at the time of testing. However, more data would be needed to confirm this suggestion.

(4.5)

Observed response (P02):		Target-like response:	
En	tog	Et	tog
INDF.M.SG	train.N.SG	INDF.N.SG	train.N.SG
'A train'		'A train'	

(4.6)

Observed response (P25):		Target-like response:	
Et	edderkopp	En	edderkopp
INDF.N.SG	spider.M.SG	INDF.M.SG	spider.M.SG
'A spider'		'A spider'	

In the definite condition, a total of 461 responses were elicited. The total percentage of suffix omission is 32.10% (148/461), and the mean rate of omission is 35.38% (SD= 39.207, range: 0-100%). The definite suffix is omitted relatively equally across genders. When we look at the omission rates, we see that even though the mean omission is high, there is much variation within the group. Importantly, only 3 participants have omission scores above 90% while half of the participants (n=11) rarely or never omit the definite suffix. Interestingly, most participants (n=8) who rarely or never omit the definite suffix are aged 6;9 or older. In addition, there is no statistically significant difference between the omission rates in the indefinite and the omission rates in the definite condition (paired Wilcoxon test: V=40, p=0.08817) which means that the participants do not omit the article or suffix significantly more in one of the conditions. This was also found for Greek (cf. Section 4.1).

[11] There were 4 participants who produced few nouns, and their accuracy scores were, therefore, somewhat inflated.
[12] There were 8 children who scored above 90% and 1 child who scored 87,50%.

The total accuracy of gender agreement on all nouns in the definite condition is 92.58% (262/283). Table 4.4 presents the accuracy of gender agreement on all nouns as well as for each gender (M, F, N). As can be observed in Table 4.4, most children have high accuracy scores in the overall gender agreement, which implies that they have mastered the gender agreement on definite suffixes in Norwegian. Similarly to the indefinite condition, the participants seem to score very accurately in the masculine but less so in the neuter gender. This is in line with the results from Rodina and Westergaard (2013b), who studied 2 monolingual and 2 bilingual children in Tromsø, and the results from Busterud and Lohndal (2022), who studied 3 monolingual children in Trondheim. However, unlike in the indefinite condition, 10 participants used the feminine definite suffix *-a* at least on some nouns, which is in line with previous findings from monolingual children in Trondheim and Tromsø (see Section 2.4.2).

	Mean	**SD**	**Range**	**Number > 90**
All nouns	87.98 %	23.421	0-100%	13
M	98.50 %	6.555	71.43-100%	18
F	100 %[13]	0	100%	10
N	74.49 %	41.507	0-100%	12

Table 4.4: Accuracy of gender agreement in the Norwegian definite condition

When we look at the masculine definite suffix, the total accuracy of agreement is 98.73% (155/157), with the mean being 98.50% (SD=6.555). This indicates that most children seem to have mastered the definite agreement in the Norwegian masculine gender.

The total accuracy of agreement in the neuter gender is 79.07% (68/86) with a mean score of 74.49% (SD=41.507). While 12 participants score 100% in the neuter agreement, 5 of them have inflated scores. That is, their accuracy scores appear to be high because of the low number of data points in this category. Even so, these children show knowledge of the neuter gender. On the other hand, 3 participants (aged 3;7, 4;3 and 5;7) use the masculine definite suffix on all nouns and therefore, may not have discovered the neuter gender in Norwegian.

Out of the 10 participants who used the feminine definite suffix *-a*, only 5 of them did so in more than half of the feminine nouns in the study. The masculine definite suffix was used with the remaining feminine nouns they produced. This may indicate a gradual loss of the feminine suffix in more Norwegian dialects. It is worth noting that 4 participants who used the feminine definite suffix reside in Trondheim, while the remaining 6 reside in different areas of the Viken and the Vestfold and Telemark counties. Interestingly, none of the children that live in Oslo used the feminine definite suffix, which may suggest a further loss of the feminine definite suffix in the Oslo area.

Similarly to the indefinite condition, when we look at non-target-like agreement, in most cases the masculine definite suffix is produced with neuter nouns as observed in example (4.7). However, in this case, there are no participants who

[13] The mean is 100% because the cases where the masculine suffix was used with traditionally feminine nouns were counted as target-like masculine nouns.

produced the neuter suffix with masculine nouns.[14] As such, there is no indication of cross-linguistic influence in the definite gender agreement in Norwegian.

(4.7)	Observed response (P09):	Target-like response:
	Brev-en	Brev-et
	Letter-DEF.SG	Letter-DEF.SG
	'The letter'	'The letter'

Similar to the definite condition in the Greek experiment, some semantically non-target-like behavior is observed in Norwegian. Specifically, 1 participant consistently used indefinite articles in the definite condition while 2 more participants did the same in single instances.

When it comes to the accuracy scores on all nouns, there is no statistically significant difference between the indefinite and the definite condition (paired Wilcoxon test: V=13, p=0.1536). This is expected because when we look at the mean scores in Tables 4.3 and 4.4, we see that the participants perform very similarly in the two conditions. The same is true for the masculine gender agreement score although there seems to be a difference in the neuter agreement score between the two conditions. However, no statistically significant difference was found (paired Wilcoxon test: V=1.5, p=0.07394). This is somewhat surprising since the participants seem to score more accurately in the neuter agreement in the definite condition. Nevertheless, there may be a difference that does not show up in the statistical test due to the relatively low number of data points per participant or the high SD in both conditions.

4.3. Nonce noun experiment in Greek

In the indefinite condition of the Greek nonce noun task, a total of 298 responses were elicited from 15 participants. Unfortunately, in 52.35% of the instances, the indefinite article is omitted. The mean omission rate is 50.94% (SD=43.175). As such, there is a statistically significant difference in the omission rates of the indefinite article between the Greek real noun experiment and the Greek nonce noun experiment (paired Wilcoxon test: V=7.5, p=0.005202). These results indicate that the nonce task was difficult for the young children in this study. Many participants seem to have focused on remembering the nonce nouns in order to reproduce them, which may be the reason that caused them to omit the indefinite articles to a larger extent than with real nouns. I also observed that many participants initially produced indefinite articles, but they gradually stopped as the task proceeded, presumably because they were tired. However, only 5/15 participants omit the indefinite article more than 90% of the time.

Thus, it is still worth looking at the gender assignment preferences for each inflectional morpheme when the participants produced indefinite articles. Table 4.5 presents the total scores in each gender (M, F, N) for each suffix. As seen in Table 4.5, there seems to be an overall preference for the neuter gender across suffixes. This suggests that the neuter is the gender default in Greek-Norwegian bilingual children. However, it also suggests that most of the Greek-Norwegian bilingual children in this study, do not (yet) use the morphophonological gender

[14] There was 1 participant who used the suffix *-a* with several nouns of all three genders.

cues of noun endings in the same way that Greek monolinguals do when it comes to gender assignment (See Section 2.4.1).

Suffix	M	F	N
-ος (-os)	30%	0%	70%
-ας (-as)	33.33%	0%	66.67%
-ης (-is)	17.65%	0%	82.35%
-α (-a)	5.88%	17.65%	76.47%
-η/ι (-i)	2.56%	2.56%	94.87%
-ο (-o)	0%	0%	100%
-μα (-ma)	0%	0%	100%

Table 4.5: Total scores of gender preference for each morphological ending in the indefinite condition.

When we look at the indefinite articles produced with nouns ending in *-ος (-os)*, *-ας (-as)* and *-ης (-is)*, we see that most children use the neuter indefinite article exclusively (see (4.8)), whereas very few children use the masculine indefinite article (which is the expected response if they use the morphological cue), and none use the feminine indefinite article. Even though some neuter articles can be expected in the noun ending *-ος (-os)*, the high preference for the neuter article in nouns ending *-ας (-as)* and *-ης (-is)* shows that the participants overgeneralize the use of the gender default (N). Similarly, when it comes to nouns ending in *-α (-a)*, most participants use the neuter indefinite article, while only 1 participant uses the feminine indefinite article that would be the expected gender based on the morphophonological gender cue.

(4.8) Observed response (P23): Expected response:

Ένα	δέλ-ης	Ένας	δέλ-ης
Èna	dèl-is	Ènas	dèl-is
INDF.N.SG	delis-M.SG	INDF.M.SG	delis-M.SG
'A delis'		'A delis'	

Regarding nouns ending in *-η/ι (-i)*, the neuter indefinite article is by far the most used (see (4.9)). Only 1 child in one instance produces the feminine indefinite article. This behavior indicates that the Greek-Norwegian bilingual children do not (yet) view the noun ending *-η/ι (-i)* as ambiguous (F or N); this differs from the behavior of Greek monolinguals (see Section 2.4.1). Finally, for nouns ending in *-ο (-o)* and *-μα (-ma)*, only the neuter indefinite article is produced which is the expected response since both noun endings are unambiguously neuter. It is important to note that the overgeneralization of the default gender could be partially due to the difficulty of the nonce task. Some children (n=5) seem to take the morphophonological cues into account at times in a qualitatively similar way to Greek monolinguals.[15] This could indicate that these children are able to use morphophonological cues for gender assignment to a higher degree at this stage, but they did not do so because of the task's difficulty. Interestingly, most of these children (n=4) are literate in Greek which may indicate that literacy plays a role in this.

[15] Only 1 child uses all the morphophonological cues as expected.

(4.9) Observed response (P12):

Ἕνα	γράξ-ι
Èna	gràks-i
INDF.N.SG	graksi-N.SG
‘A graksi’	

Most expected responses:

Ἕνα/Μία	γράξ-ι/η
Èna/Mìa	gràks-i
INDF.N.SG/INDF.F.SG	graksi-N/F.SG
‘A graksi’	

In the definite condition of the Greek nonce task, a total of 299 responses were elicited. However, in 42.81% of the responses, the definite article is omitted, and the mean omission rate is 43.01% (SD= 38.124). Additionally, there is a statistically significant difference between the omission rates of definite articles in the Greek real noun experiment and the Greek nonce noun experiment (paired Wilcoxon test: V=1, p=0.003264). Again, these results suggest that the task was very demanding for the children. However, we notice that the children omit the definite article less often than the indefinite, which indicates that the increased article omission may be partially caused by the task’s great memory demand. In other words, the participants may be initially focused on accurately reproducing the nonce noun, thus forgetting the indefinite article, which would happen less in the definite condition since they have recently reproduced the nonce noun.

Table 4.6 presents the total scores in each gender (M, F, N) for each suffix. As can be seen in Table 4.6, the participants overgeneralize the use of the neuter gender with all suffixes except for *-α (-a)*. However, the use of neuter articles is slightly more limited in the definite condition, which may indicate a higher awareness of the morphophonological gender cues in this condition.

Suffix	M	F	N
-ος (-os)	34.78%	0%	65.22%
-ας (-as)	41.18%	0%	58.82%
-ης (-is)	26.09%	4.35%	69.57%
-α (-a)	5.59%	55.56%	38.89%
-η/ι (-i)	2.08%	6.25%	91.57%
-ο (-o)	0%	0%	100%
-μα (-ma)	4.76%	9.52%	85.71%

Table 4.6: Total scores of gender preference for each morphological ending in the definite condition.

Regarding the definite articles produced with nouns ending in *-ος (-os)*, *-ας (-as),* and *-ης (-is)*, we see that most children default to the neuter gender, but there is a slight increase in the production of masculine and feminine definite articles in comparison to the indefinite condition. This increase is even more prominent in nouns ending in *-α (-a)* where most participants (n=7) produced the feminine definite article (see (4.10)) and only 3 used the neuter. This difference between the two conditions could be because the children were more familiar with the nonce nouns by the time they had to produce the definite form and thus were able to pay closer attention to the morphophonological gender cues of the noun endings.

(4.10) Observed response (P11):

Η	γοργι-ά
I	gorgi-à
DEF.F.SG	gorgia-F.SG

Expected response:

Η	γοργι-ά
I	gorgi-à
DEF.F.SG	gorgia-F.SG

'The gorgia' 'The gorgia'

As far as the definite articles used with nouns ending in *-η/ι (-i)* are concerned, we see that most participants produce the neuter article, while only 3 participants produce both feminine and neuter articles. This also implies that the participants may have used one gender in the indefinite condition but another gender in the definite, possibly because they had more time to process the gender-related cues provided to them and hence become aware of the cue's ambiguity. When it comes to nouns ending in *-ο (-o)*, all the participants produced the neuter definite article in all nouns, which shows that the suffix offers unambiguous information concerning gender. Finally, most participants used the neuter definite article with nouns ending in *-μα (-ma)*, although there are single instances where participants use the masculine or the feminine article.

4.4. Nonce noun experiment in Norwegian

In the indefinite condition of the Norwegian nonce noun experiment, a total of 353 responses were elicited from 18 participants. However, in 59.77% of the responses, the indefinite article is omitted, and the mean article omission is 64.68% (SD=43.416). Additionally, there is a statistically significant difference in the indefinite article omission rate between the Norwegian real noun task and the Norwegian nonce noun task (paired Wilcoxon test: V=1, p<0.001). These results demonstrate how challenging the nonce noun task was for the young participants in this study since most of them rarely used indefinite articles. This could probably be because they concentrated their effort in recalling the nonce nouns accurately. Article omission is most common for the youngest participants who completed the task as most participants aged 6;9 or older use indefinite articles most of the time.

When we look at the indefinite articles the participants use, we see that all the participants use the masculine indefinite article on all the nonce nouns irrespective of their endings as illustrated in (4.11). Firstly, this confirms that the masculine gender is the Norwegian gender default, which is in line with previous findings (see 2.2.2). Secondly, this shows that the different noun endings of the Norwegian nonce nouns do not seem to affect gender assignment in Greek-Norwegian bilingual children.

(4.11)

Observed response (P03):		Most expected response:	
En	spuv	En	spuv
INDF.M.SG	spuv.N.SG	INDF.M.SG	spuv.N.SG
'A spuv'		'A spuv'	

In the definite condition of the Norwegian nonce noun experiment, a total of 364 responses were elicited. However, the definite suffix is omitted in 74.45% of the responses while the mean omission is 76.53% (SD=40.805). Also, there is a statistically significant difference in the definite suffix omission rates between the Norwegian real noun experiment and the Norwegian nonce noun experiment (paired Wilcoxon test: V=0, p<0.001). These results show that the nonce task was very difficult for this study's participants. However, the significantly higher omission rate, in this case, may also partially be due to the inflectional nature of

definiteness in Norwegian (see Section 2.2.2). In other words, it may be more difficult for the children to inflect the nonce nouns because of their unfamiliarity than it is to use the indefinite article before the unfamiliar nouns. It is interesting to note that most (n=5) of the children that use definite suffixes were aged 6;9 years or older and 4 of them are literate in both Greek and Norwegian which could play a role in their awareness of inflection.

Like the indefinite condition, in all cases where participants use definite suffixes, they produce the masculine definite suffix no matter the noun ending, as seen in (4.12). Again, this further shows that the masculine gender is the gender default in Norwegian and that Greek-Norwegian bilingual children do not seem to base gender assignment on noun endings in Norwegian. Finally, these results, combined with the results observed in the indefinite condition, suggest no cross-linguistic influence in the Norwegian gender default.

(4.12)	Observed response (P24):	Most expected response:
	Børv-en	Børv-en
	Børve-DEF.SG	Børve-DEF.SG
	'The børve'	'The børve'

4.5. Comparison of Greek and Norwegian results

When the omission rates of indefinite articles in the Greek real noun task and the Norwegian real noun task are compared, there is a statistically significant difference (paired Wilcoxon test: V=151, p=0.0255). Specifically, children seem to omit the indefinite article more frequently in Greek. This is not very surprising since Greek does not seem to be the dominant language for most of this study's participants and therefore, a somewhat more accurate performance in Norwegian is not unexpected. Nevertheless, there is no statistically significant difference between the definite article omission rates in the Greek real noun experiment and the definite suffix omission rates in the Norwegian real noun experiment (paired Wilcoxon test: V=69, p=0.6293). This indicates that the participants do not omit the definite marker significantly more often in one of the two languages.

Furthermore, there is no statistically significant difference in the overall accuracy of agreement between the indefinite condition of the Greek real noun task and the indefinite condition of the Norwegian real noun task (paired Wilcoxon test: V=48.5, p=0.3257). Also, there is no statistically significant difference in the definite agreement on all nouns between the Greek and the Norwegian real noun task (paired Wilcoxon test: V=47, p=0.7536). These test results indicate that the children do not perform significantly more accurately overall in one of the two languages in either condition. In other words, the overall accuracy of gender agreement is relatively similar in the two languages.

Nonetheless, we see clear differences between the two languages when we look at the children's performance in each gender. Specifically, almost all children perform at ceiling in the neuter gender in Greek, whereas almost all children perform at ceiling in the masculine gender in Norwegian. In addition, the children overgeneralize the neuter gender in Greek and the masculine gender in Norwegian, which demonstrates a clear difference in the gender default in each language. It is also worth pointing out that the weakest performance is observed

in the masculine gender in Greek and the neuter gender in Norwegian. A final difference is that while all children have a 3-gender system in Greek, all children seem to have a 2-gender system in Norwegian since none of them produce the feminine indefinite article *ei*. Some children have a 3-declension class system in Norwegian, but they use the feminine definite suffix only to some extent. Therefore, there cannot be a comparison of the children's accuracy in the feminine agreement between the two languages.

Finally, when we compare the omission of indefinite articles in the Greek and Norwegian nonce tasks, we find no statistically significant difference (paired Wilcoxon test: V=19, p=0.7223). This suggests that the participants do not omit indefinite articles significantly more frequently in the nonce task in one of the two languages. However, we find a statistically significant difference when we compare the omission of the definite marker in the Greek and Norwegian nonce tasks (paired Wilcoxon test: V=12, p=0.03763). As argued above, this may be due to the difficulty involved in inflecting unfamiliar nouns.

4.6. Contributing factors

To examine the contribution of different factors to the linguistic data, I divided the participants into two groups for each factor of interest and then I ran non-paired two-sample Wilcoxon tests. The following factors are investigated: (i) the participant's gender, (ii) home language(s), (iii) age, (iv) literacy, (v) Greek schooling, and (vi) birth order. These are discussed below. Because of the relatively limited scope of this project, I only look at the influence that these factors have on the accuracy of gender agreement in the real noun task. As such, I test the contribution of each factor in the target-like use of Greek indefinite articles, Greek definite articles, Norwegian indefinite articles, and Norwegian definite suffixes. It is important to note that these tests only offer indirect evidence regarding the influence of each factor since I assume that when the two groups behave statistically significantly differently, it is due to the factor that separates them.

When it comes to the participant's gender, there is no statistically significant difference in the gender agreement in either language or condition between boys and girls.[16] This means that the participant's gender does not seem to play a role in the target-like gender agreement in either language.

With regard to home language(s), I compared the accuracy scores of children who are only or mainly exposed to Greek at home (group G) to the scores of children who are exposed to more languages at home (group G+) to determine whether amount of input influences the accuracy of gender agreement. I find that there is a statistically significant difference between the two groups both in the Greek indefinite gender agreement (non-paired two-sample Wilcoxon test: W=69, p=0.04858) and the Greek definite gender agreement (non-paired two-sample Wilcoxon test: W=55.5, p=0.04067). Specifically, in the indefinite gender agreement, group G has an average score of 90.72% (SD=13.600), while group

[16] For the Greek indefinite condition (non-paired two-sample Wilcoxon test: W=32.5, p=0.3505). For the Greek definite condition (non-paired two-sample Wilcoxon test: W=33.5, p=0.8294). For the Norwegian indefinite condition (non-paired two-sample Wilcoxon test: W=57, p=0.8642). For the Norwegian definite condition (non-paired two-sample Wilcoxon test: W=56.5, p=0.6085).

G+ scores 72.99% (SD=19.630) on average. In the definite gender agreement, group G has a mean score of 95.65% (SD=13.147), while the G+ group's mean score is 81.40% (SD=18.849). Thus, we observe that the children who are only or mainly exposed to Greek at home have higher accuracy of gender agreement scores, and this implies that the amount of input is important for gender agreement performance in the minority language (Greek). Importantly, there is no statistically significant difference between the two groups neither in the Norwegian indefinite gender agreement (non-paired two-sample Wilcoxon test: W=42.5, p=0.2331) nor in the Norwegian definite gender agreement (non-paired two-sample Wilcoxon test: W=35.5, p=0.2468). The similar performance between the two groups signifies that gender agreement in the majority language (Norwegian) is not negatively affected when a child only or mainly exposed to the minority language (Greek) at home.

When we compare the accuracy scores of participants aged above 6 years to the accuracy scores of those aged below 6 years, we find no statistically significant difference in the Greek indefinite condition (non-paired two-sample Wilcoxon test: W=60.5, p=0.2081), in the Greek definite condition (non-paired two-sample Wilcoxon test: W=42.5, p=0.4444), in the Norwegian indefinite condition (non-paired two-sample Wilcoxon test: W=34, p=0.08105), or in the Norwegian definite condition (non-paired two-sample Wilcoxon test: W=35, p=0.2158). Surprisingly, these results indicate that age is not a significant factor in the accuracy of gender agreement, which is in contrast with previous research findings. However, it is important to keep in mind that the groups are small from a statistical viewpoint, and the linguistic performance within each group can vary a lot, which can affect the result of statistical tests. Importantly, in the Norwegian indefinite condition, we observe that $p<0.1$, which means that it could potentially be statistically significant in a larger group of participants. As mentioned earlier, participants over 6 years old perform more accurately in the neuter agreement in the Norwegian indefinite condition, which implies that age may play a role.[17]

Literacy is the next factor studied. Here, I investigated whether literacy in each language influences gender agreement in the respective language. There is no statistically significant difference in the Greek indefinite gender agreement (non-paired two-sample Wilcoxon test: W=32, p=0.812) or the Greek definite gender agreement (non-paired two-sample Wilcoxon test: W=32.5, p=0.8134). However, only 5 participants are literate in Greek in my sample which is probably an insufficient number to determine whether literacy influences gender agreement. For Norwegian, there is no statistically significant difference in the indefinite gender agreement when we compare the scores of participants who are literate in Norwegian to those who are illiterate (non-paired two-sample Wilcoxon test: W=34, p=0.08105). However, it can be observed that $p<0.1$, which may indicate that literacy could be proven to influence the indefinite gender agreement in Norwegian if larger groups were compared. There is no statistically significant difference between the score of literate and illiterate participants in the definite gender agreement in Norwegian (non-paired two-sample Wilcoxon test:

[17] We also see that children above the age of 6 years omit the indefinite article and the definite suffix less frequently both in the real and the nonce noun tasks in Norwegian which suggests that age plays a role in the use of determiners in Norwegian.

W=35, p=0.2158). In summary, literacy seems to have no effect on the accuracy of the indefinite and the definite gender agreement in Greek as well as the definite gender agreement in Norwegian, but it may influence the accuracy of indefinite gender agreement in Norwegian.

Looking at the accuracy scores in the indefinite condition of the Greek real noun task, we find no statistically significant difference between children who attend Greek lessons and children who do not (non-paired two-sample Wilcoxon test: W=37, p=0.5291). We also find no statistically significant difference when we compare the performances of these two groups in the Greek definite gender agreement (non-paired two-sample Wilcoxon test: W=31, p=0.6278). However, it is worth noting that the mean scores of both groups are relatively high both in the indefinite (84% for the children who attended Greek schooling and 78.49% for those who did not) and the definite condition (89.61% for the children who attended Greek schooling and 86.42% for those who did not). Also, the children who attend Greek lessons do so for only one or two hours a week. This could be too little to influence gender agreement, or schooling could not be necessary at all given the already high accuracy scores.

The final factor I examine is birth order. Specifically, I compared the gender agreement scores of children who are the only or oldest child in the family (i.e., have no older siblings) to scores of age-matched children who are second- or third-born (those that have older siblings). Interestingly, there is a statistically significant difference between the two groups in the accuracy of the indefinite gender agreement in Greek (non-paired two-sample Wilcoxon test: W=67.5, p=0.0116). The group of children who are the only or oldest child in their family scores higher than the group of children who are second- or third born (mean: 89.32% (SD=15.204) and mean: 64.20% (SD=14.647), respectively). This indicates that birth order influences the accuracy of the indefinite gender agreement in Greek. However, there is no statistically significant difference between the two groups in the Greek definite gender agreement (non-paired two-sample Wilcoxon test: W=39.5, p=0.4996).

5. Discussion

In this chapter, I discuss the results presented in Chapter 4 in order to answer the research questions introduced in Section 2.6.

The outline of this Chapter is as follows. In Section 5.1, I discuss the acquisitional patterns of the bilingual Greek-Norwegian gender acquisition of Greek (5.1.1) and Norwegian (5.1.2). These patterns are also compared to previous findings from monolinguals and bilinguals who have Greek or Norwegian as one of their languages. In Section 5.2, I discuss the gender defaults of the Greek-Norwegian bilinguals in each language and relate them to previous research findings. In Section 5.3, I examine the children's sensitivity to morphophonological gender cues and compare it to findings from previous research. In Section 5.4, I consider the evidence regarding cross-linguistic influence in the Greek-Norwegian language combination and further examine it in contrast to cross-linguistic influence documented in other language pairs. In Section 5.5, I discuss the factors that I investigated and relate my findings to previous studies. Finally, in Section 5.6, I briefly evaluate the methodological design of this study and suggest improvements that future research may find useful.

5.1. Bilingual Greek-Norwegian gender acquisition

The first aim of this thesis is to describe the acquisition patterns and identify the gender defaults in Greek-Norwegian grammatical gender acquisition. Research questions 1 and 2 relate to this goal and are repeated here for convenience:

1. What are the acquisitional patterns in the bilingual Greek-Norwegian gender acquisition of Greek and Norwegian?
2. How do these acquisitional patterns compare to Greek and Norwegian monolingual and other Greek or Norwegian bilingual children?

Below, I first discuss the acquisition of Greek gender (Section 5.1.1), followed by the acquisition of Norwegian gender (Section 5.1.2).

5.1.1. Greek-Norwegian acquisition of Greek gender

Based on the results from previous studies (see Section 2.4.1), my predictions regarding gender acquisition in Greek (RQ1) were as follows: (i) all children have discovered the grammatical gender feature, (ii) all children have acquired the neuter gender, but accuracy in the feminine and masculine genders varies, (iii) some overgeneralization of the neuter gender is expected with masculine and feminine noun phrases.

As we saw in the previous chapter, not all children in the present sample have completely acquired grammatical gender in Greek, but most children have completed the first stage of gender acquisition, gender discovery, because they produce articles from all three genders. However, some children in the sample do not use articles from all three genders. Specifically, six children do not seem to have discovered the masculine gender, and two of them only use neuter articles. This suggests that these two children have not discovered gender at all in Greek. This contrasts with previous findings from younger monolingual children (Mastropavlou, 2006) as well as similarly aged simultaneous Greek-English

bilingual children (Unsworth et al., 2014) who perform at ceiling in all three genders – a fact that implies that they have discovered Greek gender. Similar findings are also reported in Egger et al. (2018), where all Greek-Dutch bilinguals except for four produce articles from all three genders and thus have discovered gender in Greek. These four children only produced neuter articles and had low vocabulary scores. This seems to be somewhat similar to the six children in the present study. That is, most of these children are second- or third-born and exposed to several languages at home (see also Section 5.5) which suggests a more limited amount of Greek input. Additionally, it is important to remember that there is a considerable deal of syncretism between the masculine and the neuter which indicates that the masculine may be the least transparent gender in Greek. This could mean that the input that these children receive may (still) be insufficient for the discovery of the masculine gender. It is however unclear whether the input will eventually be sufficient for gender discovery in these children or whether they will only partially acquire the Greek gender system. Future research is necessary to explore whether gender discovery in Greek can be impeded when exposure to Greek is very limited.

Furthermore, the second prediction was confirmed: the neuter gender is acquired by all children in the study, the feminine by most (n=14), and the masculine only by some (n=8). This demonstrates that the bilingual acquisitional order of the three genders in Greek reflects the frequency order of the three genders in child-directed and early child speech. According to Stephany and Christofidou (2008), neuter nouns are the most frequent, followed by feminine and then masculine nouns. The acquisitional order observed here seems to be in line with previous research on Greek monolingual (Kaltsa et al., 2017; Mastropavlou, 2006), Greek-Dutch bilingual (Egger et al., 2018), and English-Greek bilingual children (Kaltsa et al., 2019; Unsworth et al., 2014). However, a different acquisitional order is observed in Albanian-Greek (Kaltsa et al., 2017; Prentza et al., 2019) and German-Greek bilingual children (Kaltsa et al., 2019). Specifically, these children seem to acquire the masculine before the feminine gender. This difference indicates that the gender acquisitional order in Greek bilinguals may be influenced by the other language being acquired. Furthermore, this acquisitional pattern reveals that the second stage of gender acquisition, i.e., rule formulation based on morphological and syntactic gender cues, is prolonged in Greek-Norwegian bilinguals compared to Greek monolinguals. If one considers that bilinguals are exposed to two languages, a prolonged gender acquisition process is not unexpected and aligns with previous research on Greek English (Unsworth et al., 2014) and Greek-Dutch bilinguals (Egger et al., 2018).

The third prediction was also confirmed since all Greek non-target-like nominal phrases were observed mainly in masculine and somewhat in feminine nouns. In all these cases, the neuter was overgeneralized. This is in line with previous research on Greek-English (Kaltsa et al., 2017; Karayiannis et al., 2021; Unsworth et al., 2014), Albanian-Greek (Kaltsa et al., 2017), Greek-Dutch (Egger et al., 2018; Tsimpli & Hulk, 2013) and German-Greek bilinguals (Kaltsa et al., 2019). Additionally, a short-lived stage of neuter overuse has been observed in Greek monolingual children (Mastropavlou, 2006), which implies that the gender acquisitional patterns are qualitatively similar in Greek monolinguals and bilinguals.

In addition to the gender acquisitional patterns, I observed a relatively high rate of article omission in both indefinite and definite phrases. Egger et al. (2018) reported something similar for Greek-Dutch bilinguals, who often omitted the definite article. Since both studies used the elicited production method, the high article omission rates could be caused by the experimental design. However, I noticed that most children who consistently use the indefinite and definite articles are aged 6;2, or older. This may indicate the age when Greek-Norwegian bilinguals consistently start using Greek definite and indefinite articles. However, there seems to be a difference between the indefinite and definite article: the latter is also consistently used by several children below the age of 6, while the indefinite article is not. This implies that the definite article emerges before the indefinite in Greek-Norwegian bilinguals, in line with what has been suggested for Greek monolinguals (Marinis, 2003). I also observed significantly higher gender agreement accuracy in the definite compared to the indefinite condition, especially in the masculine (see Section 4.1). I suspect that the earlier target-like use of definite masculine nominal phrases is related to the following: (i) earlier acquisition of the definite article in Greek, and (ii) lack of syncretism in the nominative case of definite masculine nominal phrases.

5.1.2. Greek-Norwegian acquisition of Norwegian gender

When it comes to gender acquisition in Norwegian, my predictions based on previous research (see Section 2.4.2) were as follows: (i) all children have discovered that Norwegian has gender, (ii) most children have higher accuracy scores in the masculine than in the neuter, (iii) most children have higher accuracy scores in the definite condition, (iv) most children produce few or no feminine indefinite articles, (v), not all children produce feminine definite suffixes in feminine nouns, and (vi) most children overuse the masculine values with neuter nouns at least to some extent.

The first prediction is partially confirmed as most Greek-Norwegian bilingual children produce both the masculine and the neuter indefinite articles and definite suffixes, which indicates that they have discovered that Norwegian possesses grammatical gender. This is in line with Rodina and Westergaard (2013b), who found that very young Norwegian monolinguals and English-Norwegian bilinguals use both masculine and neuter indefinite articles and definite suffixes, which suggests that they have discovered gender in Norwegian. The only exception in the present study concerns three children, aged 3;7, 4;3, and 5;7, who only use the masculine indefinite article and definite suffix on all nouns they produce. This suggests that they may not have discovered gender in Norwegian yet.

The second prediction is also borne out as most children perform at ceiling in the masculine, which implies that they have acquired the masculine gender. Most of them demonstrate considerably lower accuracy scores in the neuter gender, which indicates a slower acquisition of the neuter. This acquisitional pattern is in line with previous findings from Norwegian monolingual (Busterud & Lohndal, 2022; Busterud et al., 2019; Rodina & Westergaard, 2013b, 2015a), Norwegian-Russian bilingual (Rodina & Westergaard, 2013a, 2015b), and Norwegian-English bilingual children (Rodina & Westergaard, 2013b). It is important to point out that Rodina and Westergaard (2015a) found that the gender system in Norwegian monolinguals is not in place until around 7 years of age due to the slow

acquisition of the neuter. In the present study, most children (n=8) who score high in the neuter gender agreement are aged 6;2 years or older. This indicates that bilingualism did not delay the Norwegian gender acquisition in Greek-Norwegian bilinguals.

Even though no statistically significant difference was found, higher accuracy scores are observed in the definite condition of the Norwegian real noun experiment in comparison to the indefinite condition. This is especially true for the children's scores in the neuter gender, which confirms the third prediction. Similar results have been previously documented for Norwegian monolingual (Busterud & Lohndal, 2022; Busterud et al., 2019; Rodina & Westergaard, 2013b, 2015a), Norwegian-Russian bilingual (Rodina & Westergaard, 2013a, 2015b), and Norwegian-English bilingual gender acquisition (Rodina & Westergaard, 2013b). This indicates that the definite suffixes are acquired before the indefinite articles in Norwegian, which agrees with previous findings from monolingual Norwegian acquisition (Kupisch et al., 2009). As mentioned in Section 2.4.2, Rodina and Westergaard (2013b) suggest that the acquisition of definite suffixes may be the trigger for gender acquisition in Norwegian. This hypothesis is supported by the gender agreement results of the Greek-Norwegian bilingual children because they are more accurate in their use of definite suffixes compared to indefinite articles, which implies that the definite suffixes are acquired first.

None of the Greek-Norwegian bilinguals in this study produced the feminine indefinite article *ei* which is in line with the fourth prediction. With nouns where the feminine article could have been expected, the masculine *en* was used instead. This has been previously observed in Norwegian monolingual (Busterud & Lohndal, 2022; Busterud et al., 2019; Rodina & Westergaard, 2013b, 2015a) as well as Norwegian-Russian (Rodina & Westergaard, 2013a, 2015b) and Norwegian-English bilingual children (Rodina & Westergaard, 2013b). The reason why the Greek-Norwegian bilinguals do not use the feminine definite article seems to be the general loss of the feminine in many Norwegian dialects, as documented by previous research (see Section 2.2.2).

Unlike the feminine indefinite article, approximately half of the Greek-Norwegian bilinguals produce the feminine definite suffix, as expected. None of the children residing in Oslo produce the definite suffix *-a,* which could indicate the complete loss of the feminine definite suffix in the Oslo area. The gradual loss of the definite suffix *-a* in the Oslo dialect has been documented by Lundquist and Vangsnes (2018). Furthermore, the remaining children use the feminine definite suffix to varying extents. Unfortunately, the large variation between speakers and the limited sample of this study do not allow me to determine whether this indicates a loss of the feminine definite suffix in more dialects. However, I believe that it is unlikely for the children who rarely produce the feminine definite suffix to start doing so more frequently in the future since the Norwegian gender system seems to be in place for many of them. Overall, there may be signs of the loss of the definite suffix *-a* in more dialects, but future research in large groups of Norwegian speakers of different ages is necessary to conclude that.[18]

[18] This issue is addressed in the "Grammatical Gender in Norwegian Dialects: Variation, Acquisition & Change (GenVAC)" research project which is currently being conducted.

The final prediction was also confirmed as we see that the Greek-Norwegian bilinguals who have not completed the gender acquisition process in Norwegian mainly produce the masculine indefinite article and definite suffix with neuter nouns. The same results have been reported for Norwegian monolingual (Busterud & Lohndal, 2022; Busterud et al., 2019; Rodina & Westergaard, 2013b, 2015a), Norwegian-Russian bilingual (Rodina & Westergaard, 2013a, 2015b), and Norwegian-English bilingual children (Rodina & Westergaard, 2013b).

All in all, we see similarities in most aspects of the results obtained in this study to previous research on Norwegian monolinguals and bilinguals. This indicates that the Greek-Norwegian bilinguals acquire the Norwegian gender system in a qualitatively similar manner to Norwegian monolinguals and other Norwegian bilinguals.

In addition to the gender marking patterns, I noticed that the Greek-Norwegian bilinguals omitted both the indefinite article and the definite suffix relatively often. The highest omission rates were observed in the definite suffix. This could be a consequence of the methodological design, especially since the children did not have to use a phrase before producing the definite form like they had to in the indefinite condition. Rodina and Westergaard (2013a) who also used elicited production tasks observed indefinite article and definite suffix omission in some children, though not to the degree that the present study did. What is rather surprising is that the Greek-Norwegian bilinguals omit the definite suffix more frequently than the indefinite article even though they become target-like in the use of the former before the latter. Additionally, consistent use of the indefinite article is seen at younger ages than consistent use of the definite suffix, which is in contrast to patterns observed in Norwegian monolinguals (Kupisch et al., 2009) and other bilinguals (Rodina & Westergaard, 2013a). I hypothesize that the high definite suffix omission rates seen in the Greek-Norwegian bilinguals may be due to cross-linguistic influence because Greek expresses definiteness prenominally instead of post-nominally. Somewhat similar behavior has been observed in a corpus study by Anderssen and Bentzen (2013) where a young English-Norwegian bilingual child sometimes used the prenominal definite marker instead of the definite suffix. The authors suggest that this is because of cross-linguistic influence from English. As such, the omission pattern observed in the Greek-Norwegian bilinguals is rather unique, and therefore, further research is necessary to determine whether it can be attributed to cross-linguistic influence.

5.2. The gender defaults in Greek-Norwegian bilingual children

The third RQ also relates to the first goal of the present study and is repeated here:

3. What is the gender default of Greek-Norwegian bilingual children in Greek and Norwegian, and how does this compare to the monolingual default?

Based on previous findings from monolingual and bilingual acquisition of Greek (See Section 2.4.1), I anticipated that the neuter is the Greek gender default in Greek-Norwegian bilinguals, too. This prediction is confirmed when we look at the following observations. As discussed in Section 5.1.1, the neuter gender is the

first to be discovered and acquired by the Greek-Norwegian bilinguals as well as the gender with the highest accuracy scores in the real noun task. This indicates that the neuter is the available gender value that the learners can default to in the initial stages of gender acquisition, when input may still be insufficient or unanalyzed (Tsimpli & Hulk, 2013, p. 128).

Moreover, all the non-target-like behavior in the real noun task consists of cases where the neuter determiner was used with masculine and feminine nouns. That is, the neuter is the only gender that the Greek-Norwegian bilinguals overgeneralize in the Greek real noun task. In addition, the neuter is the most assigned gender value across suffixes in the nonce noun task (see Section 4.3). This indicates that in cases where the children have not (yet) developed sensitivity to a morphophonological gender cue or have not paid sufficient attention to the suffix, the neuter value is usually assigned (see Section 5.3 for more). Considering the gender overuse in non-target-like nominal phrases in the real noun task and the gender preference across suffixes in the nonce noun task, I conclude that the neuter is the gender default in Greek for the Greek-Norwegian bilinguals. This aligns with previous findings from monolinguals and bilinguals (Alexiadou et al., 2020; Egger et al., 2018; Kaltsa et al., 2017; Kaltsa et al., 2019; Karayiannis et al., 2021; Mastropavlou, 2006; Tsimpli & Hulk, 2013; Unsworth et al., 2014).

When it comes to Norwegian, the learner gender default is the masculine (see Section 2.2.2). Therefore, I predicted that the same will be true for the Greek-Norwegian bilinguals. As far as the gender acquisition order in Norwegian is concerned, the masculine is the first gender that the Greek-Norwegian bilinguals discover and acquire, whereas the neuter is discovered and acquired later in the acquisition process. This indicates that the masculine gender is the most likely default value for the bilinguals. In fact, this is confirmed when we look at the gender use in non-target-like nominal phrases in the Norwegian real noun task. Most children use the masculine article and suffix with neuter nouns, which suggests that the masculine is the gender default. Finally, the Greek-Norwegian bilinguals assigned the masculine to all nonce nouns in the Norwegian nonce noun task. This further confirms that masculine is the Norwegian gender default, which is in line with previous findings from monolingual and bilingual Norwegian gender acquisition (Rodina & Westergaard, 2013a, 2013b, 2015a, 2015b; Trosterud, 2001; Urek et al., 2022).

5.3. Sensitivity to gender cues in Greek-Norwegian bilingual children

The fourth RQ relates to the first goal of my study and is repeated here for convenience:

4. Do Greek-Norwegian bilingual children take morphophonological cues for gender assignment into account?

The Greek-Norwegian bilinguals' sensitivity to the morphophonological gender cues provided by Greek noun endings was tested in the nonce noun task. Based on previous findings (see Section 2.4.1), I predicted the following: (i) the Greek-Norwegian bilinguals overuse the neuter across suffixes, (ii) older children predict

the gender of novel Greek nouns more accurately than younger children, and (iii) the Greek-Norwegian bilinguals are more accurate in assigning gender to nonce nouns compared to the young Greek-English bilinguals in Karayiannis et al. (2021).

The nonce noun experiment data show that there is a strong preference for the neuter gender across all noun endings which is in line with the first prediction. When we look at the data we see that all children accurately assign gender to the nouns with endings of neuter predictive value (*-ο (-o)* and *-μα (-ma)*), approximately half the children (n=7) assign some feminine values to nouns with the ending of feminine predictive value (*-α (-a)*), only few children (n=5) assign masculine values to nouns with endings of masculine predictive value (*-ος (-os)*, *-ας (-as)* and *-ης (-is)),* and even fewer children (n=3) assign both feminine and neuter values to nouns with an ambiguous noun ending ((*-η/ι (-i)*).

The gender cue sensitivity patterns provide three interesting implications. Firstly, the development of sensitivity to gender cues seems to follow the order of gender acquisition. That is, the children are most sensitive to the noun endings found in the genders they have already acquired and least sensitive to the ones found in the genders they are still acquiring. Secondly, the children do not (yet) use the morphophonological gender cues of all noun endings for gender assignment of nonce nouns similarly to Greek monolinguals (see Mastropavlou, 2006; Mastropavlou & Tsimpli, 2011; Varlokosta, 2011 for adults and Mastropavlou, 2006 for children). However, they assign gender to the nouns with high predictive neuter value, similarly to adult monolinguals and children. Additionally, they exhibit a preference for the neuter in the noun endings *-α (-a)* and *-η/ι (-i),* which is also seen in young Greek monolingual children (3;0 to 3;7 years) (Mastropavlou, 2006).

This assignment pattern shows that the Greek-Norwegian bilinguals are in the process of developing sensitivity to the morphophonological gender cues. This process seems to be qualitatively similar to the one observed in Greek monolingual children. Yet, the development of sensitivity to gender cues seems to be prolonged in the Greek-Norwegian bilinguals compared to Greek monolinguals. This is not surprising because bilinguals experience a prolonged second stage of gender acquisition (see Section 5.1.1). I hypothesize that this could be because the children have not yet reached the necessary threshold of lexical knowledge that allows them to take the morphophonological gender cues into account when assigning gender to novel nouns (Tsimpli & Hulk, 2013). The development of sensitivity to gender cues will seemingly be completed once the children have reached the required lexical threshold.

The second prediction was not supported by the data because the children that assign the expected gender values the most are not the oldest in the group. In other words, age does not seem to play a facilitatory role in gender assignment accuracy. However, most of the children that assigned the expected gender value to some extent are first-born children who are exposed to only Greek at home. Because of this, these children receive a higher amount of Greek input. Thus, they may have greater lexical knowledge than the rest of the group. If that is the case, their higher accuracy in gender assignment could mean that they are closer to the vocabulary threshold required to develop a sensitivity to the

morphophonological gender cues of noun endings (Tsimpli & Hulk, 2013). Stronger lexical abilities have been proven to predict more accurate gender assignment of nonce nouns in Albanian-Greek (Kaltsa et al., 2017; Prentza et al., 2019) and Greek-English bilinguals (Kaltsa et al., 2017). Higher early exposure to Greek has also been shown to predict more accurate gender assignment of nonce nouns in Greek-German and Greek-English bilinguals (Kaltsa et al., 2019).

Lastly, the gender assignment patterns observed in the present study resemble the ones observed in the young Greek-English monolinguals (6-8 years) in Karayiannis et al. (2021) because both groups demonstrate a strong preference for the gender default. Nevertheless, when we compare the accuracy scores of the two groups closely, we notice that the Greek-Norwegian bilinguals assign the expected gender value more frequently than the Greek-English bilinguals in all the noun endings that have high predictive gender values (*-oς (-os)*, *-ας (-as)*, *-ης (-is), -α (-a), -ο (-o)* and *-μα (-ma))* which supports the third prediction. The only exception is found in the ambiguous noun ending in *-η/ι (-i).* All but three of the Greek-Norwegian bilinguals assign only the neuter gender value to all nouns ending in *-η/ι (-i),* whereas the Greek-English bilinguals assign both feminine and neuter values with a strong preference for the neuter. It is important to note that the overall more accurate gender assignment seen in the Greek-Norwegian bilinguals is not likely due to age because the mean age of the Greek-English bilinguals (8;1 years) is higher than the mean age of the Greek-Norwegian bilinguals who completed the nonce task (6;8 years). I suggest that the more accurate performance of the Greek-Norwegian bilinguals indicates that they are more sensitive to gender cues than Greek-English bilinguals because Norwegian has gender. This is in line with previous findings from Albanian-Greek (Kaltsa et al., 2017) and German-Greek bilinguals (Kaltsa et al., 2019).

For the Norwegian nonce noun task, I examined whether the Greek-Norwegian bilingual children are influenced by the Norwegian noun endings *-e* and *-v* when it comes to gender assignment. These are the only endings that Norwegian monolingual adults have been shown to be sensitive to (Urek et al., 2022). As I expected, the children did not seem to be sensitive to the gender cues provided by the noun endings *-e* and *-v*: they only produced the masculine indefinite article and definite suffix independently of the noun ending. Similar results for Norwegian nonce nouns ending in *-e* are seen in Norwegian monolingual children (Gagliardi, 2012). Finally, these findings are also in line with Urek et al. (2022) who found that Norwegian monolingual adults only assigned the masculine gender value to nonce nouns when the elicited production methodology was used. However, the adults displayed some sensitivity to the two noun endings when they were given a list of the nonce nouns and asked to read each noun with one of the three indefinite articles (*en, ei, et)*. Unfortunately, this method could not have been employed in the age range of the participants of this study since most of them are not yet literate in Norwegian.

5.4. Cross-linguistic influence in bilingual Greek-Norwegian acquisition of gender

The second goal of this project is to investigate which factors influence the acquisition of grammatical gender in Greek-Norwegian bilingual children. RQ5 is related to this goal and is repeated here:

5. Is there cross-linguistic influence in Greek-Norwegian gender acquisition?

Based on the findings reported in Egger et al. (2018), my predictions were the following: (i) there is no cross-linguistic influence in the form of delay of gender discovery in Greek, and (ii) there is cross-linguistic influence in the form of acceleration of gender discovery in Norwegian.

The first prediction is confirmed since most children use articles from all three genders in Greek. As discussed in Section 5.1.1, there are four children in the sample who have not discovered the masculine gender and two who have not discovered that Greek has grammatical gender. While this could be interpreted as a sign of cross-linguistic influence in the form of delay, I do not believe that this is the case. If the opacity of gender in Norwegian delayed gender discovery in Greek, I would expect a larger part of the sample to be affected. In addition, I would expect that the delay would be mainly observed in the youngest children who have not discovered the gender feature in Norwegian yet. However, when we look at the demographical characteristics of the six children, we see that most of them (n=5) are around the age of 6 years or older. Most of the children are second- or third-born and exposed to more languages than Greek at home, which suggests a lower amount of Greek input. This is, in my opinion, the most likely reason why they have not (yet) discovered all genders in Greek.

To examine whether there is cross-linguistic influence in gender discovery in Dutch, Egger et al. (2018) compared the gender agreement accuracy scores of the Greek-Dutch bilinguals to those of age-matched English-Dutch bilinguals and Dutch monolinguals. To my knowledge, there has been no research on bilingual English-Norwegian gender acquisition in the age range of the present study. Therefore, I will compare the Greek-Norwegian bilinguals' performance to that of the similarly aged Norwegian-Russian bilinguals in Rodina and Westergaard (2013a), and (2015b) as well as to the two youngest Norwegian monolingual groups in Rodina and Westergaard (2015a). As discussed in 5.1.2, all three studies observed high accuracy scores in the masculine indefinite article and definite suffix across groups of participants. Additionally, lower accuracy scores were seen in the neuter, especially in the indefinite article but slightly less so in the definite suffix.

The Norwegian monolinguals in Rodina and Westergaard (2015a) have higher accuracy scores in the neuter gender compared to both the Greek-Norwegian and the Norwegian-Russian bilinguals. This means that the Greek-Norwegian bilinguals do not score on par with the Norwegian monolinguals, which contrasts with Egger et al. (2018), where the Greek-Dutch bilinguals score as high as the Dutch monolinguals. This implies that even if there is cross-linguistic facilitation from Greek to Norwegian, the effect is not as strong as the one seen in Egger et al. (2018).

When we take a closer look at the Greek-Norwegian bilinguals' accuracy scores in the neuter gender in Norwegian, we notice a numerical difference that suggests a more accurate performance compared to the Norwegian-Russian bilinguals. There seem to be two potential explanations for this difference: (i) the methodological differences between this study and Rodina and Westergaard's studies, and (ii) a cross-linguistic effect that facilitates neuter acquisition in Norwegian. The methodological difference in the experimental design of each study is the

following: the present study elicited unmodified indefinite (article + noun) and definite nominal phrases (noun + suffix) while Rodina and Westergaard (2013a), (2015a) and (2015b) elicited modified indefinite nominal phrases (article + adjective + noun) and double definite modified nominal phrase (determiner + adjective + noun + suffix). Hence, the present study elicited simpler nominal phrases which could be why the accuracy scores are generally higher. More accurate performance in unmodified nominal phrases compared to modified nominal phrases has been found for bilingual children in previous research (Prentza et al., 2019; Unsworth et al., 2014).

The other possible explanation for the more accurate performance of the Greek-Norwegian bilinguals in the neuter is cross-linguistic influence. That is, gender discovery in Greek happens very early in the acquisition process because of high gender cue transparency. Moreover, the neuter has a very prominent position in the Greek gender system, being the linguistic and learner default as well as the most common gender in child and child-directed speech (Stephany & Christofidou, 2008). This could create a facilitatory cross-linguistic effect that is responsible for the higher accuracy scores in the neuter in Norwegian, which would be similar to the cross-linguistic effect found in Egger et al. (2018). Such an effect would be unlikely for Norwegian-Russian bilinguals due to the lower degree of gender cue transparency as well as the position of the neuter gender in the Russian gender system (Rodina & Westergaard, 2015b). Nevertheless, further research is necessary to determine whether the higher accuracy scores of the Greek-Norwegian bilinguals are due to methodological differences between the studies or due to a facilitatory cross-linguistic effect.

As we saw in Section 5.2, Greek and Norwegian have different gender defaults which allows me to examine whether there is cross-linguistic influence in that domain. Specifically, I investigate whether the Greek-Norwegian bilinguals use the masculine gender in Greek and the neuter gender in Norwegian in contexts where it is not expected. In this case, I predicted that there would be no cross-linguistic influence in either gender default because both default values seem to develop early in gender acquisition (Egger et al., 2018; Mastropavlou, 2006; Rodina & Westergaard, 2013b). There are indeed no signs of cross-linguistic influence in the Greek gender default. The neuter is the only gender that the Greek-Norwegian bilinguals overuse in non-target-like nominal phrases in both the real and the nonce noun experiments.

However, there may be some signs of cross-linguistic influence in the Norwegian default. Three children (aged 3;7, 5;9, and 7;9) produced the neuter indefinite article with masculine nouns up to three times. All three children are only exposed to Greek at home and the two oldest children moved to Norway at the age of 3 or later, which could indicate that Greek is their dominant language. Future research with Greek-Norwegian bilinguals who live in Greece could investigate whether dominance in Greek has a cross-linguistic effect on the Norwegian default. That is, if there is cross-linguistic influence in the Norwegian default, I would expect the use of neuter articles with masculine nouns to be more common in Greek-Norwegian bilingual children who live in Greece, assuming that their dominant language is Greek. Nevertheless, it is important to mention that this behavior was neither exhibited in the definite condition of the real noun experiment nor the nonce noun experiment in Norwegian. In addition,

the use of the neuter indefinite article with masculine nouns has been seen in some Norwegian-Russian bilinguals, too (Rodina & Westergaard, 2013a), which indicates that it may not be caused by cross-linguistic influence.

5.5. The main factors and their influence on bilingual Greek-Norwegian gender acquisition

The final research question is also related to the second goal of the present thesis and is therefore repeated here:

6. Which factors influence the acquisition of grammatical gender in Greek-Norwegian bilingual children?

I will discuss the factors that may contribute to Greek-Norwegian gender acquisition in the following order: (i) transparency, (ii) home language(s), (iii) age, (iv) literacy, (v) Greek schooling, and (vi) birth order. The first four factors concern both Greek and Norwegian gender acquisition, whereas the last two are only relevant for Greek.

Based on previous findings from monolingual and bilingual gender acquisition in Greek and Norwegian (see Section 2.5), I made the following predictions: (i) the Greek gender system develops at a fast pace due to its high degree of transparency, and (ii) the gender system in Norwegian is acquired slowly due to its opacity. The first prediction is borne out because we see that children as young as about 4 years have not only discovered but also perform at ceiling in all three genders in Greek. Early gender discovery and acquisition have been previously documented for Greek monolingual children (Mastropavlou, 2006), Greek-Dutch bilingual (Egger et al., 2018), and Greek-English bilingual children (Unsworth et al., 2014). Additionally, it is noteworthy that the Greek-Norwegian bilinguals discover and acquire the most transparent gender (neuter) first and the least transparent gender (masculine) last in Greek. This also seems to be the case for Greek monolingual children (Mastropavlou, 2006), Greek-Dutch bilingual (Egger et al., 2018), and Greek-English bilingual children (Unsworth et al., 2014).

The second prediction is also confirmed as there is only one child below the age of 6 years who has discovered the masculine and the neuter in Norwegian as well as performs at ceiling in both genders. In other words, the opacity of the Norwegian gender system leads to a slower acquisition process compared to the one in Greek. As such, the degree of transparency of each gender system plays a major role in the Greek-Norwegian bilingual gender acquisition in each language. An interesting implication that arises from these findings is that transparent gender systems may require a lower input threshold that children need to reach in order to discover and acquire gender in comparison to the input threshold necessary for the acquisition of opaque gender systems (Egger et al., 2018).

With regard to the amount of input received in each language, home language(s) was used as a proxy. Based on previous research findings (see Section 2.5), I predicted the following: (i) children who are only or mainly exposed to Greek at home (group G) are more accurate in the Greek gender agreement than the children who are exposed to more languages at home (group G+) and (ii) children in group G+ are not more accurate in the Norwegian gender agreement than the children in group G. The first prediction is borne out because the

children who are only or mainly exposed to Greek at home have statistically significantly higher scores both in the indefinite and in the definite gender agreement in Greek compared to the children who are exposed to more languages at home. It is also relevant to note that the mean age in group G is 5;9 years, whereas the mean age in group G+ is 6;6 years, which indicates that the difference in the two groups' performances is not due to an age effect.

Importantly, there is no statistically significant difference in the two groups' (G and G+) accuracy scores in the gender agreement in Norwegian, which confirms the second prediction. This implies that the amount of input received in the minority language affects the children's gender agreement performance in that language significantly, whereas their gender agreement performance in the majority language is not affected. This is in line with Rodina and Westergaard (2013a) and (2015b) who found that Norwegian-Russian monolinguals who were exposed solely to Russian by both parents were more accurate in marking gender in Russian than children who were exposed to Russian by one parent and Norwegian by the other. In addition, the two groups in these studies performed similarly in gender marking in Norwegian. Similar findings have been documented for Greek-English (Unsworth et al., 2014) and English-Welsh (Gathercole & Thomas, 2005) bilingual gender acquisition, where more accurate performance in the gender marking is observed in the minority languages (Greek and Welsh) in children with a greater amount of input in these languages.

When it comes to the contribution of the amount of exposure to each language over time, the age of the children was used as a proxy. This means that I assume that older children (above the age of 6) have been exposed to each language for a longer period of time than younger children (below the age of 6). I made the following predictions: (i) the older children's gender agreement scores are not significantly more accurate than those of younger children in Greek and (ii) the older children perform more accurately than younger children in the Norwegian gender agreement. As seen in Section 4.6, the older children do not perform significantly more accurately than the younger children in the Greek gender agreement which confirms the first prediction. This agrees with previous research indicating that amount of current exposure plays a greater role in bilingual gender acquisition in Greek than the amount of exposure over time (Unsworth et al., 2014).

Furthermore, the older children do not perform significantly more accurately than the younger children in the Norwegian gender marking either. This is somewhat surprising for two reasons: (i) the amount of exposure over time has been proven to play an important role in the acquisition of an opaque gender system (Dutch) (Unsworth, 2013; Unsworth et al., 2014), and (ii) the age of (approximately) 7 years has been argued to be when gender is in place in Norwegian monolinguals (Rodina & Westergaard, 2015a). It is important to consider that there is a considerable numerical difference ($p<0.1$) between the scores of the older and the younger children in the Norwegian indefinite gender agreement. Specifically, the older children are generally more accurate in the indefinite gender agreement in Norwegian compared to the younger children. Considering the limited sample of the present study, the amount of input over time could be proven to play a significant role in the development of the indefinite gender marking in Norwegian if a larger group of children is tested. Therefore, further investigation is necessary

to conclude whether age contributes significantly to the indefinite gender marking accuracy in Norwegian.

I also sought to examine whether literacy contributes to Greek-Norwegian bilingual gender acquisition. To achieve this, I compared the gender accuracy scores of literate children to those of illiterate children for each language. Based on previous research on Greek (see Section 2.5), I hypothesized that children who are literate in Greek would not be more accurate than illiterate children in Greek gender marking. Similarly, I expected no difference between the two group's performance in marking gender in Norwegian. The first prediction is borne out because there is no significant difference between the gender accuracy scores of literate and illiterate children in Greek. This means that literacy does not affect gender marking accuracy in Greek real nouns, which is in line with previous findings from Albanian-Greek (Kaltsa et al., 2017), English-Greek, and German-Greek bilingual children (Kaltsa et al., 2019). It is worth mentioning that literacy may influence the Greek-Norwegian bilinguals' accuracy scores in the gender assignment of Greek nonce nouns as most children who assign the expected gender value to some extent are literate. This observation agrees with the results reported by Kaltsa et al. (2017) and Kaltsa et al. (2019).

As far as the second prediction is concerned, the data seem contradictory at first glance. That is, there seems to be a considerable numerical difference between the scores of literate and illiterate children in the indefinite gender agreement in Norwegian. Specifically, literate children in Norwegian seem to be noticeably more accurate in the Norwegian indefinite gender agreement in comparison to children who are not yet literate. When we take a closer look at the group of children who are literate in Norwegian, we see that it consists of all children who are above the age of 6 years. This means that there is a correlation between age and literacy in Norwegian in this sample. Therefore, I suspect that this finding is most likely due to age and not literacy.

The present study also explored the contribution that Greek schooling may have on gender accuracy in Greek. Previous research in the bilingual acquisition of Greek gender had found that receiving schooling in Greek contributes to the gender assignment accuracy with regards to nonce nouns only (Kaltsa et al., 2019; Prentza et al., 2019). Therefore, I anticipated no difference between the Greek gender marking accuracy scores of children who receive Greek schooling and the scores of children who do not. This is confirmed by the data since both groups perform similarly in the indefinite and the definite Greek gender agreement. In addition, no difference can be observed in the performance of the two groups in the Greek nonce nouns. This is in contrast to previous findings (Kaltsa et al., 2019; Prentza et al., 2019). There are three potential explanations for this. Firstly, the data obtained in the nonce noun task in the present study is rather limited. Secondly, the Greek-Norwegian bilinguals are considerably younger than the bilinguals in Kaltsa et al. (2019); Prentza et al. (2019). Thirdly, the Greek-Norwegian bilinguals received very limited Greek schooling in comparison to the bilinguals in the other two studies. Thus, further research with Greek-Norwegian bilinguals is needed to determine whether Greek schooling contributes to the gender assignment accuracy in nonce nouns.

Finally, I examined the contribution of birth order in the bilingual Greek-Norwegian gender acquisition in Greek by comparing the gender agreement scores of first-born children and children without siblings to the scores of age-matched second- and third-born children. In this case, I expected that birth order may play a role in the gender performance of bilingual children in the minority language (Greek) as it has been shown to be important for bilingual acquisition in other language domains (see Section 2.5). Interestingly, this prediction is supported by the data as first-born children (mean age: 6;3 years) perform significantly better in the Greek indefinite gender agreement in comparison to second- and third-born children (mean age: 5;11 years). Even though birth order has proven to play a major role in bilingual children's vocabulary acquisition, this is to the best of my knowledge a new finding for bilingual gender acquisition and grammar acquisition in general. This result seems to indicate that birth order affects the amount of input that second- and third-born children receive in the minority language. That is, most siblings prefer to speak the majority language to each other which means that second- and third-born children are exposed to the majority language from birth even when both parents only speak the minority language (Bridges & Hoff, 2014; Shin, 2002).

In conclusion, this discussion demonstrated that there are various factors contributing to the Greek-Norwegian bilingual gender acquisition. Overall, these factors are often interrelated, which makes it challenging to consider them individually. An important implication of the findings discussed here is that the degree of transparency of each gender system seems to dictate the amount of input that is necessary for gender discovery and acquisition. Highly transparent gender systems seem to have a lower input threshold since most bilinguals seem to discover and acquire gender early even with limited input. On the other hand, gender acquisition of an opaque gender system requires a higher amount of input, which leads to a slower gender acquisition process. It would be interesting for further research to explore gender acquisition of an opaque gender system when that belongs to the minority language. It would not be surprising if children do not fully develop the opaque gender system in cases where input is very limited.

Nevertheless, as we see in the data, the amount of input is crucial for gender discovery and acquisition even in highly transparent gender systems. Greek-Norwegian bilinguals who are only exposed to Greek at home are significantly more accurate in marking gender in Greek compared to children who are exposed to more languages at home. First-born bilinguals are also more accurate in marking gender in Greek than second-born bilinguals. Most of the children that receive very limited Greek input seem to struggle to discover and acquire the masculine and some have not discovered that Greek has gender. In addition, the amount of input over time does not seem to significantly contribute to the Greek gender acquisition. These observations raise the question of whether the input will ever be sufficient for gender discovery and acquisition or whether these children will only partially acquire the Greek gender system. This question is left for future research.

5.6. Evaluation of the methodology

The elicited production method employed in the present study has been widely adopted by the scientific community to study monolingual and bilingual gender acquisition. Based on the data collection in my study, I suggest that this methodological design was appropriate for the achievement of the research goals. Firstly, the elicited production design enabled me to control the linguistic data I obtained. This means that I was able to determine the number of nouns I elicited in each gender so that I could identify the gender acquisitional patterns in each language. Because of this, the elicited data were comparable, which made the within- and between-group comparison simple.

Secondly, this experimental design was proven to be suitable for the entire age range of participants in this study (3;7-9;7 years). That is, almost all participants were able to finish the real noun task even though this study tested a higher number of nouns compared to previous studies (e.g., Egger et al., 2018). In addition, the children found the real noun task interesting and fun. With regard to the nonce noun task, the scenario used to introduce the children to the task captured their attention. It is also noteworthy that the pictures of the novel objects that were used in this task sparked curiosity even in the older children in the sample, which made a generally demanding task more engaging.

Though this method was overall suitable both for the participants and the research goals, there were also some challenges. As far as the real noun task is concerned, the main challenge was that the children often forgot to use the article or suffix and produced a bare noun. This could be because the children were very eager to show their knowledge of the word and proceed with the game (forming full sentences takes more time), or it could be because the child has not started using articles or suffixes yet. To minimize this problem and discern between those two scenarios the children were asked to repeat their answers using the phrase "I see" first. This proved to be a successful solution because most children produced indefinite articles when they repeated their answers. A minor challenge was that the children could not remember some nouns, often in the least dominant language (Greek), while they could produce the noun in the dominant language. To deal with this, I provided the first syllable of the noun they could not remember which was usually sufficient to elicit the target noun.

When it came to the nonce noun task, most participants experienced difficulty in remembering the nonce nouns even after I repeated them twice. This resulted in different types of behavior. Some, especially the younger participants, forgot the nonce noun and thus needed me to repeat it three or more times before they were able to recall it. Other participants used nonce nous from previous slides. It was also common for participants to alter the noun endings both in the Greek and the Norwegian nonce noun tasks. The change was often either switching the noun endings of the two nonce nouns in a slide (e.g., original nonce nouns: *tryspe* and *stirv*, participant 12: *trysp* and *spirve*) or assigning the same noun ending to both nouns (e.g., original nonce nouns: *sprøv* and *prylk*, participant 03: *sprølk* and *prylk*). The occasional change of noun endings resulted in the accidental use of real words (e.g., original nonce nouns: *kløsp* and *slafte*, participant 04: *kløft* and *slafte*) which had to be excluded from the data analysis.

These types of behavior reveal that the nonce task was challenging for the young participants of this study which was also confirmed by the fact that most of the youngest participants did not manage to finish the task because they felt tired. This also led them to be reluctant to do the nonce task the second time and, in some cases, decline to do the task because they remembered that it was difficult to recall the nonce nouns. The memory challenge that this task presented may have also been the reason for the significantly higher article and suffix omission rates in the nonce noun tasks. This is also supported by the fact that some children started omitting articles in the middle of the task, presumably because they got tired while a few participants started using the default gender exclusively.

Even though the nonce task proved to be demanding for the participants, the majority was able to go through at least half of the items, which may indicate that this method remains suitable for this age group, though adjustments to the material design would be advised to future research that chooses this method. Specifically, the task would be less challenging for the children if they only had one novel item to interact with at a time. For example, future studies could consider having one novel object and one familiar object on the screen at a time instead of two novel objects. Then the children would have only one novel noun to remember at a time. Another option would be to have fewer items overall, but this would be very limiting for Greek because of the plethora of noun endings. Alternatively, the written form of the nonce nouns could be provided under the pictures of the novel objects. However, this solution does not apply to children that cannot read, and it could affect gender assignment in Greek because of the gender information found in the orthography of nouns (e.g., *-η (-i)* and *-ι (-i)* are pronounced the same, but the former is only found on feminine nouns while the latter on neuter nouns). Finally, another solution could be to conduct the nonce task on a different day than the real noun task to lower the mental demand of each session.

In conclusion, despite the difficulties of the nonce noun experiments, I argue that the results obtained are reliable and valid because the children exhibited similar gender assignment patterns, which are also in line with patterns observed in other studies on monolingual and bilingual gender acquisition.

6. Conclusion

The present study investigated the acquisition of grammatical gender in Greek-Norwegian bilingual children. I examined gender acquisition in both languages by eliciting indefinite and definite unmodified nominal phrases with real and nonce nouns from 22 children aged 3;07-9;07. To the best of my knowledge, this was the first time that bilingual grammatical gender acquisition has been investigated in this language combination. As such, this study offers new insights into the bilingual gender acquisition patterns in a language pair that varies widely both in terms of transparency and gender default. Additionally, the present study adds to a large body of research concerning the factors that influence bilingual gender acquisition.

6.1. Main findings

This study had the following research goals: (i) to identify the acquisitional patterns and the gender defaults in Greek-Norwegian grammatical gender acquisition and (ii) to investigate which factors influence the acquisition of grammatical gender in Greek-Norwegian bilingual children.

Regarding the first goal, I found that Greek-Norwegian bilinguals acquire gender in Greek in a manner qualitatively similar to Greek monolinguals and other Greek bilinguals. Most children in my sample have completed the first stage of gender acquisition as they are using all three genders, and they are in the process of completing the second stage, i.e., formulation of rules based on lexical and syntactic cues. A few children (n=7) have fully acquired the Greek gender system and use all three genders target-like. In line with Egger et al. (2018), I found that the second stage is prolonged in these bilingual children; in other words, they reach full acquisition somewhat later than monolingual children. Neuter gender, the learner default value, is somewhat overused with feminine and masculine nouns for a longer period. Neuter gender is also overused with nonce nouns across noun endings, but many children have started developing sensitivity to morphophonological gender cues in Greek. Lastly, I found that the Greek-Norwegian bilinguals are more sensitive to Greek morphophonological gender cues compared to the young Greek-English bilinguals in Karayiannis et al. (2021), which supports previous research suggesting that children who acquire two languages with gender are more sensitive to gender cues than children who acquire one language with gender and one language without gender (Kaltsa et al., 2017; Kaltsa et al., 2019).

Furthermore, I found that the bilingual Greek-Norwegian children acquire Norwegian gender qualitatively similarly to Norwegian monolinguals and other Norwegian bilinguals. Most children have discovered gender in Norwegian and have higher accuracy scores in the definite suffixes compared to the indefinite articles. The children score high on masculine gender, which is the learner default, and they often overuse it with neuter nouns. None of the children in my sample produce the feminine indefinite article and only few produce the feminine definite suffix. This was expected given the ongoing loss of the feminine gender and to some extent the feminine declension class that is reported in previous research (see Section 2.2.2). In line with previous research on Norwegian monolingual children and adults, the Greek-Norwegian bilinguals do not seem to

be sensitive to the morphological gender cues provided by the noun endings *-v* and *-e.* Instead, they exclusively used the masculine gender with nonce nouns.

Concerning my second research goal, I found no cross-linguistic influence on the acquisition of Greek gender. However, there may be some cross-linguistic influence in the acquisition of the neuter gender in Norwegian. In addition, there is no cross-linguistic influence on the Greek gender default because the Greek-Norwegian bilinguals' gender default in Greek is the same as in Greek monolinguals and other Greek bilinguals. Most children show no signs of cross-linguistic influence in the Norwegian gender default as they overuse the masculine similarly to Norwegian monolinguals and other Norwegian bilinguals.

Moreover, I found that transparency, home language(s), age, and birth order significantly influence Greek-Norwegian bilingual gender acquisition. On the other hand, literacy and Greek schooling were not found to play a role in gender accuracy with real nouns. The degree of transparency of each gender system seems to affect its acquisition pace. Home language plays an important role in the acquisition of Greek gender, but it does not affect the acquisition of Norwegian gender. That is, Greek-Norwegian children who were mainly exposed to Greek at home were significantly more accurate in Greek gender marking than children who were exposed to more languages at home. However, the performance of the two groups in Norwegian was very similar. The children's age did not have a statistically significant effect on their gender accuracy in Greek, but it played an important role in the children's gender accuracy in Norwegian since children over the age of 6 were considerably more accurate than children below the age of 6. Finally, I found that birth order plays a role in bilingual Greek-Norwegian gender acquisition because first-borns and children without siblings were significantly more accurate in the Greek gender agreement compared to similarly aged second- and third-born children. This finding seems to be associated with the amount of input that children receive in the minority language. The role of birth order had previously been found to affect lexical acquisition in bilingual children, but my findings show that it also plays a role in the acquisition of grammatical features such as gender.

6.2. Limitations and future research

The present study investigated Greek-Norwegian bilingual gender acquisition by eliciting indefinite and definite unmodified nominal phrases. This provided a valuable first insight into gender acquisition in this population. Unfortunately, the limited scope of this project did not allow me to examine gender marking in other parts of speech such as adjectives, possessives, or pronouns. Therefore, an obvious next step could be to research gender agreement in different components of the two languages. Additionally, I did not explore whether Greek-Norwegian bilingual children consider semantics (e.g., animacy) or phonological criteria such as stress and the number of syllables for gender marking. This is something left to future research. Lastly, while the present study investigated the role of many different factors in bilingual gender acquisition, there are also some factors that were not included. Future research may examine these additional factors, such as the age of onset of bilingualism and vocabulary knowledge.

During the data collection for this study, I noticed that most children did not seem to have acquired the accusative case which needed to be used in the indefinite condition of the Greek experiments. Instead, the children used the nominative case. Although the acquisition of case was beyond the scope of the present study, it remains an interesting topic for future research.

The participants of the present study acquired a two-gender system in Norwegian, while some maintained the feminine declension class to varying extents. Future research could explore bilingual (Greek-)Norwegian gender acquisition in children who acquire a Norwegian dialect that has a three-gender system. Potentially, their acquisitional patterns differ from the ones observed in the present study as they would acquire feminine gender and feminine declension class.

This study provided evidence that birth order influences grammatical gender acquisition in the minority language. Since this is a new finding, future research should study if this is also the case in other language pairs. Future studies could also examine the influence of birth order in other grammatical domains (e.g., acquisition of case or word order). Lastly, future research could study older Greek-Norwegian bilinguals to find out whether birth order and amount of input affect the end state of their gender systems. That is, it may be worth exploring if later-born bilinguals and bilinguals who were not mainly exposed to Greek at home acquire a somewhat reduced gender system in Greek or whether they "catch up" with the children who were first-born or mainly exposed to Greek at home.

It would also be interesting for future studies to examine bilingual gender acquisition in Greek-Norwegian bilingual children who live in Greece. In that case, Greek is the majority language and Norwegian is the minority language. This research would confirm whether there is cross-linguistic influence in the Norwegian gender default (see Section 5.4). Additionally, it would offer important insights into gender acquisition when Norwegian, a language with opaque gender, is acquired as the minority language. To the best of my knowledge, there has been no research on gender acquisition by simultaneous bilingual children acquiring a minority language with a non-transparent gender system. Such research would enable the comparison between the gender acquisitional patterns of children who acquire Greek as the minority and Norwegian as the majority language to the patterns of children who acquire Greek as the majority and Norwegian as the minority language. This could enhance our understanding of the intricate interplay between transparency, language dominance, and amount of input.

References

Alexiadou, A., Rizou, V., Tsokanos, N., & Karkaletsou, F. (2020). Gender Agreement Mismatches in Heritage Greek. *Languages*, *6*(1), 1-34. https://doi.org/doi:10.3390/languages6010003

Anastasiadi-Symeonidi, A., & Cheila-Markopoulou, D. (2003). Sinchronikes ke diachronikes tasis sto genos tis Elinikis: mia theoritiki protasi [Synchronic and diachronic trends in the Greek gender: a theoretical proposal]. In A. Anastasiadi-Symeonidi, A. Ralli, & D. Cheila-Markopoulou (Eds.), *To Genos [Gender]* (pp. 13-56). Patakis Publishers.

Anderssen, M. (2007). The Acquisition of Compositional Definiteness in Norwegian. *Nordlyd*, *34*(3), 252-275. https://doi.org/https://doi.org/10.7557/12.132

Anderssen, M., & Bentzen, K. (2013). Cross-linguistic influence utside the syntax-pragmatics interface: a case study of the acquisition of definiteness. *Studia Linguistica 67*(1), 82-100. https://doi.org/https://doi.org/10.1111/stul.12011

Anderssen, M., & Busterud, G. (2022). Grammatisk kjønn og bøyningsklasse i norsk som andrespråk: En korpusstudie. *Norsk Lingvistisk Tidsskrift*, *40*(1), 87-127. https://ojs.novus.no/index.php/NLT/article/view/2073

Audring, J. (2016). Gender. In *Oxford Research Encyclopedia of Linguistics*: Oxford University Press.

Benmamoun, E., Montrul, S., & Polinsky, M. (2013). Heritage languages and their speakers: Opportunities and challenges for linguistics. *Theoretical linguistics*, *39*(3-4), 129-181. https://doi.org/https://doi.org/10.1515/tl-2013-0009

Bentzen, K. (2000). *I like not it like du like it! A case study of language transfer in bilingual first language acquisition* [Master's thesis, University of Tromsø].

Berman, R. A. (2007). Developing Linguistic Knowledge and Language Use Across Adolescence. In E. Hoff & M. Shatz (Eds.), *Blackwell Handbook of Language Development.* (pp. 347-367). Blackwell Publishing. https://doi.org/https://psycnet.apa.org/doi/10.1002/9780470757833.ch17

Bialystok, E., Craik, F. I., & Luk, G. (2012). Bilingualism: consequences for mind and brain. *Trends in Cognitive Sciences*, *16*(4), 240-250. https://doi.org/https://doi.org/10.1016/j.tics.2012.03.001

Bridges, K., & Hoff, E. (2014). Older sibling influences on the language environment and language development of toddlers in bilingual homes. *Applied Psycholinguistics 35*(2), 225-241. https://doi.org/https://doi.org/10.1017/S0142716412000379

Busterud, G., & Lohndal, T. (2022). Grammatisk hokjønn i trøndersk barnespråk: Ein korpusstudie. *Norsk Lingvistisk Tidsskrift*, *40*(1), 129-156. https://ojs.novus.no/index.php/NLT/article/view/2074

Busterud, G., Lohndal, T., Rodina, Y., & Westergaard, M. (2019). The loss of feminine gender in Norwegian: a dialect comparison. *The Journal of Comparative Germanic Linguistics*, *22*(2), 141-167. https://doi.org/https://doi.org/10.1007/s10828-019-09108-7

Carstens, V. (2000). Concord in Minimalist Theory. *Linguistic Inquiry*, *31*(2), 319-355. https://doi.org/https://doi.org/10.1162/002438900554370

Corbett, G. G. (1991). *Gender*. Cambridge University Press.

Corbett, G. G. (2007). Gender and Noun Classes. In T. Shopen (Ed.), *Language Typology and Syntactic Description: III: Grammatical categories and the lexicon* (Vol. 3, pp. 241-279). Cambridge University Press.

Corbett, G. G. (2013). Number of Genders. In M. S. Dryer & M. Haspelmath (Eds.), *The World Atlas of Language Structures Online.* Leipzig Max Planck Institute for Evolutionary Anthropology.

Cornips, L., Van der Hoek, M., & Verwer, R. (2006). The acquisition of Grammatical Gender in Bilingual Child Acquisition of Dutch (by older Moroccan and Turkish children): The Definite Determiner, Attributive Adjective and Relative Pronoun. *Linguistics in the Netherlands*, *23*(1), 40-51. http://www.meertens.nl/meertensnet/file/leoniec/20070307/Cornips_JW.pdf

Darcy, N. T. (1953). A Review of the Literature on the Effects of Bilingualism upon the Measurement of Intelligence. *The Pedagogical Seminary and Journal of Genetic Psychology*, *82*(1), 21-57. https://doi.org/https://doi.org/10.1080/08856559.1953.10533654

Egger, E., Hulk, A., & Tsimpli, I. M. (2018). Crosslinguistic influence in the discovery of gender: the case of Greek–Dutch bilingual children. *Bilingualism: Language and Cognition*, *21*(4), 694-709. https://doi.org/https://doi.org/10.1017/S1366728917000207

Eichler, N., Jansen, V., & Müller, N. (2013). Gender acquisition in bilingual children: French–German, Italian–German, Spanish–German and Italian–French. *International Journal of Bilingualism*, *17*(5), 550-572. https://doi.org/https://doi.org/10.1177/1367006911435719

Enger, H.-O. (2009). The role of core and non-core semantic rules in gender assignment. *Lingua*, *119*(9), 1281-1299. https://doi.org/https://doi.org/10.1016/j.lingua.2009.02.004

Gagliardi, A. C. (2012). *Input and Intake in Language Acquisition* [Doctoral dissertation, University of Maryland, College Park]. ProQuest.

Gao, L. (2022). Nature versus Nurture in Bilinguals' Language Acquisition. *Proceedings of the 2021 International Conference on Education, Language and Art (ICELA 2021)*, *637*, 451-453. https://doi.org/https://dx.doi.org/10.2991/assehr.k.220131.082

Gathercole, V. C. M., & Thomas, E. M. (2005). Minority Language Survival: Input Factors Influencing the Acquisition of Welsh. *Proceedings of the 4th International Symposium on Bilingualism*, 852-874.

Gathercole, V. C. M., & Thomas, E. M. (2009). Bilingual first-language development: Dominant language takeover, threatened minority language take-up. *Bilingualism: Language and Cognition*, *12*(2), 213-237. https://doi.org/https://doi.org/10.1017/S1366728909004015

Genesee, F. (2003). Rethinking Bilingual Acquisition. In J.-M. Dewaele, A. Housen, & L. Wei (Eds.), *Bilingualism: Beyond Basic Principles* (pp. 204-228). Blue Ridge Summit: Multilingual Matters. https://doi.org/https://doi.org/10.21832/9781853596315-015

Graedler, A.-L. (1998). *Morphological, Semantic and Functional Aspects of English Lexical Borrowings in Norwegian* [Doctoral dissertation, University of Oslo].

Granier-Deferre, C., Ribeiro, A., Jacquet, A. Y., & Bassereau, S. (2011). Near-term fetuses process temporal features of speech. *Developmental Science*, *14*(2), 336-352. https://doi.org/https://doi.org/10.1111/j.1467-7687.2010.00978.x

Gutiérrez–Clellen, V. F., & Kreiter, J. (2003). Understanding child bilingual acquisition using parent and teacher reports. *Applied Psycholinguistics*, *24*(2), 267-288. https://doi.org/https://doi.org/10.1017/S0142716403000158

Hockett, C. F. (1958). *A Course in Modern Linguistics*. The Macmillan Company.

Horst, J. S., & Hout, M. C. (2016). The Novel Object and Unusual Name (NOUN) Database: A collection of novel images for use in experimental research. *Behavior Research Methods*, *48*(4), 1393-1409. https://doi.org/https://doi.org/10.3758/s13428-015-0647-3

Jansen, V. (2009). *Determiners in first language acquisition of monolingual English and German children–A corpus-based investigation* [Unpublished master's thesis, Bergische Universität Wuppertal, Germany].

Jespersen, O. (1922). *Language: Its Nature, Development, and Origin* (Vol. 68). Allen & Unwin.

Johansson, S., & Graedler, A. L. (2002). *Rocka, hipt og snacksy: om engelsk i norsk språk og samfunn*. Høyskoleforlaget.

Kaltsa, M., Prentza, A., Papadopoulou, D., & Tsimpli, I. M. (2017). Language external and language internal factors in the acquisition of gender: the case of Albanian-Greek and English-Greek bilingual children. *International Journal of Bilingual Education and Bilingualism*, *23*(8), 981-1002. https://doi.org/https://doi.org/10.1080/13670050.2017.1385591

Kaltsa, M., Tsimpli, I. M., & Argyri, F. (2019). The development of gender assignment and agreement in English-Greek and German-Greek bilingual children. *Linguistic Approaches to Bilingualism*, *9*(2), 253-288. https://doi.org/https://doi.org/10.1075/lab.16033.kal

Karayiannis, D., Kambanaros, M., Grohmann, K. K., & Alexiadou, A. (2021). Assignment of Grammatical Gender in Heritage Greek. *Frontiers in Psychology*, *12*, Article 717449. https://doi.org/https://doi.org/10.3389/fpsyg.2021.717449

Karmiloff, K., & Karmiloff-Smith, A. (2002). *Pathways to language: From fetus to adolescent*. Harvard University Press.

Kisilevsky, B. S., Hains, S. M. J., Lee, K., Xie, X., Huang, H., Ye, H. H., Zhang, K., & Wang, Z. (2003). Effects of Experience on Fetal Voice Recognition. *Psychological Science*, *14*(3), 220-224. https://doi.org/10.1111/1467-9280.02435

Kupisch, T., Anderssen, M., Bohnacker, U., & Snape, N. (2009). Article Acquisition in English, German, Norwegian and Swedish. In R. P. Leow, H. Campos, & D. Lardiere (Eds.), *Little words: Their History, Phonology, Syntax,*

Semantics, Pragmatics and Acquisition (pp. 223-236). Georgetown University Press.

Kupisch, T., Müller, N., & Cantone, K. F. (2002). Gender in monolingual and bilingual first language acquisition: Comparing Italian and French. *Lingue e Linguaggio*, *1*(1), 107-150. https://doi.org/10.1418/7559

Lauro, J., Core, C., & Hoff, E. (2020). Explaining Individual Differences in Trajectories of Simultaneous Bilingual Development: Contributions of Child and Environmental Factors. *Child Development*, *91*(6), 2063-2082. https://doi.org/https://doi.org/10.1111/cdev.13409

Lehtonen, M., Soveri, A., Laine, A., Järvenpää, J., De Bruin, A., & Antfolk, J. (2018). Is bilingualism associated with enhanced executive functioning in adults? A meta-analytic review. *Psychological Bulletin*, *144*(4), 394–425. https://doi.org/https://psycnet.apa.org/doi/10.1037/bul0000142

Lødrup, H. (2011). Hvor mange genus er det i Oslo-dialekten? *Maal og Minne*, *103*(2), 120-136. http://ojs.novus.no/index.php/MOM/article/view/330

Lohndal, T., & Westergaard, M. (2016). Grammatical Gender in American Norwegian Heritage Language: Stability or Attrition? *Frontiers in Psychology*, *7*, Article 344. https://doi.org/10.3389/fpsyg.2016.00344

Lohndal, T., & Westergaard, M. (2021). Grammatical gender: Acquisition, Attrition, and Change. *Journal of Germanic Linguistics*, *33*(1), 95-121. https://doi.org/https://doi.org/10.1017/S1470542720000057

Lundquist, B., & Vangsnes, Ø. A. (2018). Language Separation in Bidialectal Speakers: Evidence From Eye Tracking. *Frontiers in Psychology*, *9*, Article 1394. https://doi.org/https://doi.org/10.3389/fpsyg.2018.01394

Manning, B. L., Harpole, A., Harriott, E. M., Postolowicz, K., & Norton, E. S. (2020). Taking Language Samples Home: Feasibility, Reliability, and Validity of Child Language Samples Conducted Remotely With Video Chat Versus In-Person. *Journal of Speech, Language, and Hearing Research*,

63(12), 3982-3990. https://doi.org/https://doi.org/10.1044/2020_JSLHR-20-00202

Marinis, T. (2003). *Acquiring the DP in Modern Greek*. John Benjamins Publishing.

Mastropavlou, M. (2006). *The Role of Phonological Salience and Feature Interpretability in the Grammar of Typically Developing and Language Impaired Children* [Doctoral dissertation, Aristotle University of Thessaloniki].

Mastropavlou, M., & Tsimpli, I. M. (2011). The Role of Suffixes in Grammatical Gender Assignment in Modern Greek: A Psycholinguistic Study. *Journal of Greek Linguistics*, *11*(1), 27-55. https://doi.org/https://doi.org/10.1163/156658411X563685

Mehler, J., Bertoncini, J., Barriere, M., & Jassik-Gerschenfeld, D. (1978). Infant Recognition of Mother's Voice. *Perception*, *7*(5), 491-497. https://doi.org/10.1068/p070491

Mehler, J., Jusczyk, P., Lambertz, G., Halsted, N., Bertoncini, J., & Amiel-Tison, C. (1988). A precursor of language acquisition in young infants. *Cognition*, *29*(2), 143-178. https://doi.org/https://doi.org/10.1016/0010-0277(88)90035-2

Meisel, J. M. (2006). The Bilingual Child. In T. K. Bhatia & W. C. Ritchie (Eds.), *The handbook of bilingualism* (pp. 91-113). Blackwell Publishing. https://doi.org/https://doi.org/10.1002/9780470756997.ch4

Mitrofanova, N., Rodina, Y., Urek, O., & Westergaard, M. (2018). Bilinguals' Sensitivity to Grammatical Gender Cues in Russian: The Role of Cumulative Input, Proficiency, and Dominance. *Frontiers in Psychology*, *9*, Article 1894. https://doi.org/https://doi.org/10.3389/fpsyg.2018.01894

Newport, E. L. (1990). Maturational Constraints on Language Learning. *Cognitive Science*, *14*(1), 11-28. https://doi.org/https://doi.org/10.1016/0364-0213(90)90024-Q

Newport, E. L., Bavelier, D., & Neville, H. J. (2001). Critical Thinking about Critical Periods: Perspectives on a Critical Period for Language Acquisition. In E. Dupoux (Ed.), *Language, brain and cognitive development: Essays in honor of Jacques Mehler* (pp. 481-502). The MIT Press.

Prentza, A., Kaltsa, M., Tsimpli, I. M., & Papadopoulou, D. (2019). The acquisition of Greek gender by bilingual children: The effects of lexical knowledge, oral input, literacy and bi/monolingual schooling. *International Journal of Bilingualism*, *23*(5), 901-920. https://doi.org/https://doi.org/10.1177/1367006917733066

Ragnhildstveit, S. (2010). Genustildeling og morsmålstransfer i norsk mellomspråk. *NOA-norsk som andrespråk*, *26*(1), 30-55. http://ojs.novus.no/index.php/NOA/article/view/1547

Ralli, A. (1994). Feature Representations and Feature-Passing Operations: The Case of Greek Nominal Inflection. *Selected papers on theoretical and applied linguistics*, *8*, 19-45. https://doi.org/https://doi.org/10.26262/istal.v8i0.6134

Ralli, A. (2000). A Feature-Based Analysis of Greek Nominal Inflection. *Glossologia*(11-12), 201-227.

Ralli, A. (2002). The role of morphology in gender determination: evidence from Modern Greek. *Linguistics*, *40*(3), 519-551. https://doi.org/https://doi.org/10.1515/ling.2002.022

Ricciardelli, L. A. (1992). Creativity and Bilingualism. *The Journal of Creative Behavior*, *26*(4), 242-254. https://doi.org/https://doi.org/10.1002/j.2162-6057.1992.tb01183.x

Rodina, Y., Kupisch, T., Meir, N., Mitrofanova, N., Urek, O., & Westergaard, M. (2020). Internal and External Factors in Heritage Language Acquisition: Evidence From Heritage Russian in Israel, Germany, Norway, Latvia and the United Kingdom. *Frontiers in Education*, *5*, Article 20. https://doi.org/https://doi.org/10.3389/feduc.2020.00020

Rodina, Y., & Westergaard, M. (2013a). Two gender systems in one mind: The acquisition of grammatical gender. In P. Siemund, I. Gogolin, M. E. Schulz, & J. Davydova (Eds.), *Multilingualism and language diversity in urban areas: Acquisition, identities, space, education* (pp. 95-126). John Benjamins Publishing Company.

Rodina, Y., & Westergaard, M. (2013b). The acquisition of gender and declension class in a non-transparent system: monolinguals and bilinguals. *Studia Linguistica*, *67*(1), 47-67. https://doi.org/https://doi.org/10.1111/stul.12012

Rodina, Y., & Westergaard, M. (2015a). Grammatical gender in Norwegian: Language Acquisition and Language Change. *Journal of Germanic Linguistics*, *27*(2), 145-187. https://doi.org/https://doi.org/10.1017/S1470542714000245

Rodina, Y., & Westergaard, M. (2015b). Grammatical gender in bilingual Norwegian-Russian Acquisition: The role of input and transparency. *Bilingualism: Language and cognition*, Advance online publication. https://doi.org/https://doi.org/10.1017/S1366728915000668

Ruben, R. J. (1997). A Time Frame of Critical/Sensitive Periods of Language Development. *Acta Oto-Laryngologica*, *117*(2), 202-205. https://doi.org/https://doi.org/10.3109/00016489709117769

Saer, D. J. (1923). The Effect of Bilingualism on Intelligence. *British Journal of Psychology: General Section*, *14*(1), 25-38. https://doi.org/https://doi.org/10.1111/j.2044-8295.1923.tb00110.x

Saffran, J. R., & Thiessen, E. D. (2007). Domain-General Learning Capacities. In E. Hoff & M. Shatz (Eds.), *Blackwell Handbook of Language Development* (pp. 68-86). Blackwell Publishing. https://doi.org/https://psycnet.apa.org/doi/10.1002/9780470757833.ch4

Shin, S. J. (2002). Birth Order and the Language Experience of Bilingual Children. *Tesol Quarterly*, *36*(1), 103-113. https://doi.org/https://doi.org/10.2307/3588366

Singleton, D. M., & Ryan, L. (2004). *Language Acquisition: The Age Factor* (2nd ed.). Multilingual Matters Ltd.

Stephany, U. (1997). The Acquisition of Greek. In D. I. Slobin (Ed.), *The crosslinguistic study of language acquisition* (Vol. 4, pp. 183-333). Lawrence Erlbaum Associates.

Stephany, U., & Christofidou, A. (2008). The Acquisition of Greek Case, Number, and Gender: A Usage-Based Approach. *Arbeitspapier 55 (Neue Folge)* University of Cologne: Institut für Linguistik, Allgemeine Sprachwissenschaft.

Trosterud, T. (2001). Genustilordning i norsk er regelstyrt. *Norsk Lingvistisk Tidsskrift*, *19*(1), 29-57.

Trudgill, P. (2013). Gender maintenance and loss in Totenmålet, English, and other major Germanic varieties. In T. Lohndal (Ed.), *In Search of Universal Grammar: From Old Norse to Zoque* (pp. 77-108). John Benjamins Publishing Company.

Tsimpli, I. (2003). The acquisition of gender in Greek as a second language. In A. Anastasiadi-Symeonidi, A. Ralli, & D. Cheila-Markopoulou (Eds.), *To Genos [Gender]* (pp. 168-189). Patakis Publishers.

Tsimpli, I. M., & Hulk, A. (2013). Grammatical gender and the notion of default: Insights from language acquisition. *Lingua*, *137*, 128-144. https://doi.org/https://doi.org/10.1016/j.lingua.2013.09.001

Unsworth, S. (2013). Assessing the role of current and cumulative exposure in simultaneous bilingual acquisition: The case of Dutch gender. *Bilingualism: Language and cognition*, *16*(1), 86-110. https://doi.org/https://doi.org/10.1017/S1366728912000284

Unsworth, S., Argyri, F., Cornips, L., Hulk, A., Sorace, A., & Tsimpli, I. (2014). The role of age of onset and input in early child bilingualism in Greek and Dutch. *Applied Psycholinguistics*, *35*(4), 765-805. https://doi.org/https://doi.org/10.1017/S0142716412000574

Urek, O., Westergaard, M., & Lohndal, T. (2022). " En splyv" eller" et splyv"? Tilordning av grammatisk genus til pseudosubstantiv i norsk. *Norsk Lingvistisk Tidsskrift*, *40*(1). http://ojs.novus.no/index.php/NLT/article/view/2070

Van Baal, Y. (2020). *Compositional Definiteness in American Heritage Norwegian* [Doctoral disseration, University of Oslo]. UiO: DUO vitenarkiv.

Varlokosta, S. (2005). *Test apodosis gramatiku genus sta usiastika tis Elinikis [Test for grammatical gender assignment to Greek nouns]*. University of the Aegean.

Varlokosta, S. (2011). The role of morphology in grammatical gender assignment: A psycholinguistic study in Greek. In A. Galani, G. Hicks, & G. Tsoulas (Eds.), *Morphology and its interfaces* (pp. 321-349). John Benjamins Publishing Company.

Velnić, M. (2020). Acquisition of a Transparent Gender System: A Comparison of Italian and Croatian. *Frontiers in Psychology*, *11*, Article 571674. https://doi.org/10.3389/fpsyg.2020.571674

Wiese, H., Alexiadou, A., Allen, S. E., Bunk, O., Gagarina, N., Iefremenko, K., Martynova, M., Pashkova, T., Rizou, V., & Schroeder, C. (2022). Heritage Speakers as Part of the Native Language Continuum. *Frontiers in Psychology*, *12*, Article 717973. https://doi.org/10.3389/fpsyg.2021.717973

Appendices

Appendix A: List of real nouns

List of real nouns used in the real noun elicitation experiment in Greek:

Masculine	υπολογιστής	ipologistìs	‘computer’
	καθρέφτης	kathrèftis	‘mirror’
	χάρτης	hàrtis	‘map’
	βάτραχος	vàtrahos	‘frog’
	πιγκουίνος	piguìnos	‘penguin’
	παπαγάλος	papagàlos	‘parrot’
	κόκορας	kòkoras	‘rooster’
	ελέφαντας	elèfantas	‘elephant’
	καρχαρίας	karharìas	‘shark’
Feminine	τηλεόραση	tileòrasi	‘television’
	αράχνη	aràhni	‘spider’
	βρύση	vrìsi	‘tap’
	κότα	kòta	‘hen’
	καρέκλα	karèkla	‘chair’
	πάπια	pàpia	‘duck’
Neuter	μήλο	mìlo	‘apple’
	άλογο	àlogo	‘horse’
	τρένο	trèno	‘train’
	φόρεμα	fòrema	‘dress’
	στέμμα	stèmma	‘crown’
	γράμμα	gràmma	‘letter’
	σπίτι	spìti	‘house’
	φίδι	fìdi	‘snake’
	κρεβάτι	krevàti	‘bed’

List of real nouns use in the real noun elicitation experiment in Norwegian:

Masculine	stol	‘chair’
	elefant	‘elephant’
	edderkopp	‘spider’
	slange	‘snake’
	datamaskin	‘computer’
	kopp	‘cup’
	kjole	‘dress’
	frosk	‘frog’
Feminine	veske	‘bag’
	høne	‘hen’

	and	‘duck’
	bok	‘book’
	seng	‘bed’
	skjorte	‘shirt’
	krone	‘crown’
	flaske	‘bottle’
Neuter	speil	‘mirror’
	kart	‘map’
	eple	‘apple’
	tog	‘train’
	hus	‘house’
	ratt	‘steering wheel’
	brev	‘letter’
	bein	‘bone’

Appendix B: List of nonce nouns

List of nonce nouns used in the nonce noun elicitation experiment in Greek:[19]

Masculine		
-ος (-os)	βεσός	vesòs
	άφουδος*	àfudos
	ψέθος*	psèthos
-ης (-is)	βακτιτής	vaktitìs
	θράτης	thràtis
	δέλης	dèlis
-ας (-as)	παθαμάς	pathamàs
	πλέας*	plèas
	γέχας*	gèhas
Feminine		
-α (-a)	βρώσσα	vròssa
	κηφίδα	kifîda
	γοργιά*	gorgià
Ambiguous F/N		
-η/ι (-i)	γράξη	gràksi
	νέξη	nèksi
	δολή	dolì
	θράβι	thràvi
	βουντί*	vuntì
	τουμάλι*	tumàli
Neuter		
-ο (-o)	βουδό	vudò
	φρεμίο*	fremìo
	κεράφυρο*	keràfiro
-μα (-ma)	γήμα	gìma
	δέζιμα	dèzima
	τούμα*	tùma

List of nonce nouns borrowed from Urek et al. (2022) and used in the nonce noun elicitation experiment in Norwegian:

Feminine -e	tryspe
	tarfe
	børve

[19] The nouns marked with an asterisk are borrowed from Varlokosta (2005) (also used in Varlokosta (2011) and in Karayiannis et al. (2021)).

	slafte
	klømpe
	gytle
	prønke
	kvumme
Neuter -v	glyv
	spalv
	spuv
	sprøv
	stirv
	trulv
	skløv
	grølv
Other	kløsp
	smalp
	knørp
	sprygg
	spløkk
	mursk
	splung
	prylk

Appendix C: Information letter

Greek information letter for the parents:

Πρόσκληση για συμμετοχή σε μελέτη για την

Γλωσσική ανάπτυξη σε δίγλωσσα ελληνό-νορβηγόφωνα παιδιά

Αγαπητοί γονείς/κηδεμόνες,

Προσκαλούμε εσάς και το παιδί σας να συμμετάσχετε σε μία μελέτη με στόχο την διερεύνηση της γλωσσικής ανάπτυξης των δίγλωσσων παιδιών που μιλούν ελληνικά και νορβηγικά. Σε αυτή την επιστολή σας δίνουμε πληροφορίες για τους στόχους της παρούσας μελέτης και για το τι θα συμπεριλάμβανε η συμμετοχή σας σε αυτή.

Στόχος
Η παρούσα μελέτη έχει στόχο να μελετήσει πως τα δίγλωσσα ελληνό-νορβηγόφωνα παιδιά ηλικίας 4-8 ετών χρησιμοποιούν αυτές τις δύο γλώσσες. Αυτή η ηλιακή ομάδα (4-8 ετών) έχει επιλεγεί με βάση τα προηγούμενα ευρήματα της ερευνητικής βιβλιογραφίας καθώς και τους στόχους της παρούσας μελέτης. Ένας αριθμός δίγλωσσων ελληνό-νορβηγόφωνων παιδιών που ανήκουν σε αυτή την ηλικιακή ομάδα θα μελετηθεί ώστε να βρούμε τις μεταξύ τους ομοιότητες και διαφορές στην χρήση των δύο γλωσσών. Στην συνέχεια, τα αποτελέσματα αυτής της μελέτης θα συγκριθούν με προηγούμενα ευρήματα από παιδιά που μιλούν μόνο ελληνικά και παιδιά που μιλούν μόνο νορβηγικά.

Ποιος είναι υπεύθυνος για την παρούσα μελέτη;
Το Νορβηγικό Πανεπιστήμιο Επιστήμης και Τεχνολογίας (Norges teknisk-naturvitenskapelige universitet, NTNU) είναι υπεύθυνο για την παρούσα μελέτη. Αυτή η μελέτη είναι μέρος εκπόνησης της μεταπτυχιακής διπλωματικής εργασίας για την οποία είναι υπεύθυνη η μεταπτυχιακή φοιτήτρια Αγορίτσα Βαγγελοκώστα. Οι επόπτες είναι η ερευνήτρια Yvonne van Baal και ο καθηγητής Terje Lohndal. Τα δεδομένα που θα συλλεχθούν κατά την διάρκεια της μελέτης θα επεξεργαστούν μόνο από τους επόπτες και την μεταπτυχιακή φοιτήτρια.

Γιατί λάβατε αυτή την πρόσκληση;
Λάβατε αυτή την πρόσκληση γιατί εσείς και το παιδί σας ανήκετε στην γλωσσική και ηλικιακή ομάδα η οποία είναι συναφής για την παρούσα μελέτη με βάση προηγούμενα ευρήματα ερευνών και τους στόχους αυτής της μελέτης.

Τι θα συμπεριλάμβανε η συμμετοχή σας στην μελέτη;
Αν εσείς και το παιδί σας αποφασίσετε να συμμετάσχετε σε αυτή την μελέτη, εσείς θα συμπληρώσετε ένα ερωτηματολόγιο και το παιδί θα πάρει μέρος σε δύο γλωσσικές ασκήσεις (μία γλωσσική άσκηση στα ελληνικά και μία στα νορβηγικά). Το ερωτηματολόγιο θα σας πάρει περίπου 10 λεπτά και περιέχει ερωτήσεις σχετικά με τις γλωσσικές συνήθειες του παιδιού και τις γλωσσικές συνήθειες των γονέων/κηδεμόνων. Το ερωτηματολόγιο θα πρέπει κατά προτίμηση να συμπληρωθεί γραπτά ή διαδικτυακά πριν την συμμετοχή του παιδιού στις γλωσσικές ασκήσεις.

Η μελέτη των παιδιών θα πραγματοποιηθεί μέσω της συλλογής γλωσσικών δεδομένων. Για την συλλογή αυτών των δεδομένων θα χρησιμοποιηθεί μια μέθοδος που έχει δημιουργηθεί για αυτόν ακριβώς τον σκοπό. Συγκεκριμένα, αυτή η μέθοδος περιλαμβάνει διάφορα παιχνίδια κατά την διάρκεια των οποίων τα παιδιά θα βλέπουν εικόνες σε μια οθόνη υπολογιστή. Αυτές οι γλωσσικές ασκήσεις θα ηχογραφηθούν και ό,τι πούνε τα παιδιά (δηλ. γλωσσικά δεδομένα) κατά την διάρκεια αυτών των ασκήσεων θα απομαγνητοφωνηθεί και θα αποθηκευτεί. Κάθε μία από τις δύο γλωσσικές ασκήσεις διαρκεί περίπου 30 λεπτά και μπορεί να γίνει αυτοπροσώπως (είτε στο σπίτι, είτε σε κάποια άλλη τοποθεσία της επιλογής σας) ή διαδικτυακά (μέσω Zoom). Η δεύτερη γλωσσική άσκηση θα διεξαχθεί περίπου μια εβδομάδα μετά την πρώτη.

Η παρούσα μελέτη πρόκειται να ολοκληρωθεί περί τις 15 Ιουλίου 2022. Τότε τα γραπτά ή ψηφιακά ερωτηματολόγια και τα ηχητικά αρχεία θα καταστραφούν και θα διατηρηθούν μόνο εντελώς ανώνυμα ηλεκτρονικά δεδομένα.

Η συμμετοχή είναι εθελοντική
Η συμμετοχή στην μελέτη είναι εθελοντική. Αν επιλέξετε να συμμετάσχετε, μπορείτε ανά πάσα στιγμή να αποσύρετε την συμμετοχή σας χωρίς να δώσετε κάποιο λόγο. Τότε όλα τα προσωπικά σας στοιχεία και δεδομένα που έχουμε συλλέξει θα διαγραφούν. Δεν θα υπάρξει καμία αρνητική συνέπεια για εσάς ή το παιδί σας αν επιλέξετε να μη συμμετάσχετε ή αν αργότερα επιλέξετε να αποσυρθείτε.

Το απόρρητο σας- πως αποθηκεύουμε και χρησιμοποιούμε τα προσωπικά σας δεδομένα
Θα χρησιμοποιήσουμε τα προσωπικά σας στοιχεία και δεδομένα μόνο για τους σκοπούς που έχουμε περιγράψει σε αυτή την επιστολή. Θα διαχειριστούμε τα προσωπικά σας δεδομένα με εχεμύθεια και σύμφωνα με τους νόμους προστασίας του απορρήτου. Τα δεδομένα που έχουν συλλεγεί από το ερωτηματολόγιο θα γίνουν ηλεκτρονικά (εάν το ερωτηματολόγιο έχει συμπληρωθεί γραπτά) για περαιτέρω επεξεργασία, και καμία πληροφορία προσωπικής ταυτοποίησης δεν θα αποθηκευτεί μαζί με αυτά τα δεδομένα. Τα γλωσσικά δεδομένα που έχουν συλλεγεί (ηχητικά αρχεία και απομαγνητοφωνήσεις) θα αποθηκευτούν σε υπηρεσία αποθήκευσης cloud (OneDrive) με ελεγχόμενη είσοδο και κωδικό πρόσβασης. Ένα αντίγραφο των γλωσσικών δεδομένων (ηχητικά αρχεία και απομαγνητοφωνήσεις) θα αποθηκευτεί σε ένα εξωτερικό σκληρό δίσκο με κωδικό πρόσβασης.

Στην υπηρεσία αποθήκευσης cloud και στο εξωτερικό σκληρό δίσκο, όλα τα ονόματα θα αντικατασταθούν με κωδικούς και οι πληροφορίες προσωπικής ταυτοποίησης θα γίνουν ανώνυμες. Κανένα παιδί δεν θα μπορεί πια να ταυτοποιηθεί μέσω των αποθηκευμένων δεδομένων εκτός και αν η μεταπτυχιακή φοιτήτρια είναι σε θέση να αναγνωρίσει κάποιο παιδί από την φωνή. Ένα συνδετικό κλειδί το οποίο περιέχει την σχέση μεταξύ κωδικών και ονομάτων θα αποθηκευτεί με απόλυτη εχεμύθεια από την μεταπτυχιακή φοιτήτρια και τους επόπτες. Το συνδετικό κλειδί είναι απαραίτητο για να καταστήσει δυνατή την ταυτοποίηση των συμμετεχόντων, κάτι το οποίο είναι επιθυμητό σε περίπτωση που κάποιος συμμετέχων αποφασίσει να αποσύρει την συμμετοχή του από την έρευνα. Μόνο η μεταπτυχιακή φοιτήτρια και οι επόπτες θα έχουν πρόσβαση στα πρωτότυπά ερωτηματολόγια και στα ηχητικά αρχεία. Στην δημοσίευση της μεταπτυχιακής διπλωματικής εργασίας ή σε άλλες πιθανές δημοσιεύσεις της παρούσας μελέτης, δεν θα είναι δυνατή η ταυτοποίηση των συμμετεχόντων.

Τι θα συμβεί στα προσωπικά σας δεδομένα όταν τελειώσουμε την έρευνα;
Τα προσωπικά σας δεδομένα θα ανωνυμοποιηθούν όταν η έρευνα τελειώσει και η μεταπτυχιακή διπλωματική εργασία έχει γίνει δεκτή κάτι που είναι προγραμματισμένο να γίνει περί τις 15 Ιουλίου 2022. Τα γραπτά και διαδικτυακά ερωτηματολόγια καθώς και τα ηχητικά αρχεία θα καταστραφούν και θα διατηρηθούν μόνο εντελώς ανώνυμα ηλεκτρονικά δεδομένα.

Ποιος μας δίνει το δικαίωμα να επεξεργαστούμε τα προσωπικά σας δεδομένα;
Θα επεξεργαστούμε τα προσωπικά σας δεδομένα μόνο με την συγκατάθεση σας.

Εκ μέρους του Νορβηγικού Πανεπιστημίου Επιστήμης και Τεχνολογίας (NTNU), το Νορβηγικό Κέντρο Ερευνητικών Δεδομένων (NSD – Norsk senter for forskningsdata AS) έχει αξιολογήσει την παρούσα μελέτη με συμπέρασμα ότι η επεξεργασία των προσωπικών δεδομένων σε αυτή την μελέτη θα γίνει σύμφωνα με τους νόμους προστασίας του απορρήτου.

Τα δικαιώματα σας
Εφόσον μπορείτε να ταυτοποιηθείτε μέσω των δεδομένων που έχουν συλλεγεί έχετε το δικαίωμα:

- Να δείτε τα δικά σας προσωπικά στοιχεία και δεδομένα τα οποία επεξεργαζόμαστε και να λάβετε αντίγραφο αυτών των δεδομένων.
- Να διορθώσετε προσωπικά στοιχεία ή δεδομένα τα οποία είναι λανθασμένα ή παραπλανητικά
- Να ζητήσετε την διαγραφή των προσωπικών σας στοιχείων και δεδομένων.
- Να στείλετε παράπονο στην Νορβηγική Αρχή Προστασίας Δεδομένων σχετικά με την διαχείριση των προσωπικών σας δεδομένων.

Εάν έχετε ερωτήσεις σχετικά με τη μελέτη ή θέλετε περισσότερες πληροφορίες ή να ασκήσετε τα δικαιώματά σας, επικοινωνήστε με την μεταπτυχιακή φοιτήτρια μέσω email ή τηλεφώνου (στα

ελληνικά, αγγλικά ή νορβηγικά). Μπορείτε επίσης να επικοινωνήσετε με τους επόπτες μέσω email (στα αγγλικά ή νορβηγικά). Ακόμη, μπορείτε να επικοινωνήσετε με τον εκπρόσωπο απορρήτου του Νορβηγικού Πανεπιστημίου Επιστήμης και Τεχνολογίας (NTNU) Thomas Helgesen (μέσω email thomas.helgesen@ntnu.no ή τηλεφώνου 93 07 90 38). Εάν έχετε ερωτήσεις σχετικά με την αξιολόγηση της μελέτης από το Νορβηγικό Κέντρο Ερευνητικών Δεδομένων (NSD), μπορείτε να επικοινωνήσετε με το NSD - Norwegian Center for Research Data AS μέσω email (personverntjenester@nsd.no) ή τηλεφώνου: 55 58 21 17.

Με φιλικούς χαιρετισμούς,

Αγορίτσα Βαγγελοκώστα	Yvonne van Baal	Terje Lohndal
Μεταπτυχιακή Φοιτήτρια	Ερευνήτρια και Επόπτρια	Καθηγητής και Επόπτης
NTNU	NTNU	NTNU
agoritsv@stud.ntnu.no	yvonne.van.baal@ntnu.no	terje.lohndal@ntnu.no

Norwegian information letter for the parents:

Vil du delta i forskningsprosjektet

Språkutvikling hos gresk-norske tospråklige barn?

Kjære foreldre/foresatte,

Dette er et spørsmål til deg og ditt barn om å delta i et forskningsprosjekt hvor formålet er å undersøke hvordan språk utvikler seg hos gresk-norske tospråklige barn. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg og ditt barn.

Formål
Målet med denne masteroppgaven er å undersøke hvordan gresk-norske tospråklige barn mellom 4 og 8 år bruker de to språkene. Denne aldersgruppen er valgt basert på tidligere funn i forskningslitteraturen samt målene med forskningsprosjektet. Flere barn i denne aldersgruppen vil bli testet for å finne likheter og forskjeller i språkbruk mellom individuelle tospråklige gresk-norske barn. Resultatene vil bli sammenlignet med tidligere funn fra enspråklige greske barn og enspråklige norske barn.

Hvem er ansvarlig for forskningsprosjektet?
Norges teknisk-naturvitenskapelige universitet (NTNU) er ansvarlig for prosjektet. Dette prosjektet er en masteroppgave som masterstudent Agoritsa Vangelokosta er ansvarlig for. Veilederne er forsker Yvonne van Baal og professor Terje Lohndal. Dataene som samles inn, vil bli behandlet av masterstudenten og veilederne.

Hvorfor får du spørsmål om å delta?
Du får spørsmål om å delta fordi du og ditt barn faller innenfor språkgruppen og aldersgruppen som vi har identifisert som aktuelle basert på tidligere forskning og formålet med prosjektet.

Hva innebærer det for deg å delta?
Hvis du og ditt barn velger å delta i prosjektet, innebærer det at du fyller ut et bakgrunnsskjema og at barnet deltar i to språklige øvelser (en språklig øvelse om gresk og en språklig øvelse om norsk). Bakgrunnsskjemaet vil ta deg ca. 10 minutter å fylle ut og inneholder spørsmål om barnets språklige bakgrunn, samt noen opplysninger om språket til foresatte. Bakgrunnsskjemaet bør helst fylles ut i forkant av de språklige øvelsene på papir eller digitalt.

Undersøkelsene av barna (i alderen 4-8 år) skal utføres gjennom innsamling av språklig datamateriale. Det skal brukes metoder som er spesielt utviklet for dette formålet, det vil si ulike spill der vi bruker bilder på dataskjerm. Det vil bli gjort lydopptak, og alt som barna sier (dvs. språklig datamateriale), skal skrives ned og lagres. Hver språklig øvelse tar barnet ca. 30 minutter og kan foregå personlig (hjemme eller på et avtalt lokale) eller på nettet (på Zoom). De to språklige øvelsene vil utføres med en ukes mellomrom.

Prosjektet skal etter planen avsluttes 15. juli 2022. De skriftlige eller digitale spørreskjemaene og lydfilene vil da destrueres, og kun fullstendig anonymiserte elektroniske data vil beholdes.

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

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Vi vil bare bruke opplysningene om deg og ditt barn til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. Vi vil gjøre dataene fra spørreskjemaet elektroniske (hvis spørreskjemaet var fylt ut skriftlig) for videre behandling, men ingen identifiserende opplysninger vil lagres sammen med dataene. Det innsamlede språklige datamaterialet (dvs. lydfiler og transkripsjon) vil bli lagret i en adgangsregulert og passord beskyttet skylagrings tjeneste (OneDrive). En kopi av språklige datamaterialet (dvs. lydfiler og transkripsjon) vil bli lagret i en passord beskyttet harddisk.
I den skylagrings tjenesten og harddisken vil navn erstattes med koder, og personidentifiserende opplysninger vil anonymiseres. Enkeltpersoner vil da ikke være direkte identifiserbare i dataene, med mindre den enkelte masterstudent er i stand til å gjenkjenne enkeltpersoner på grunnlag av stemme. En koblingsnøkkel som viser forholdet mellom koder og navn, vil bli oppbevart konfidensielt av veilederne og masterstudenten. Denne koblingsnøkkelen skal gjøre det mulig å identifisere deltakerne i studien, noe som kan være ønskelig for å identifisere deltakere som i etterkant ønsker å trekke sin deltakelse i undersøkelsen. Bare masterstudenten og veilederne vil ha tilgang til de opprinnelige spørreskjemaene og lydfilene. I masteroppgaven og evt. andre publikasjoner fra prosjektet vil det ikke være mulig å gjenkjenne enkeltpersoner.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?
Opplysningene anonymiseres når prosjektet avsluttes/oppgaven er godkjent, noe som etter planen er 15. juli 2022. De skriftlige og digitale spørreskjemaene og lydfilene vil da destrueres, og kun fullstendig anonymiserte elektroniske data vil beholdes.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

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

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:
- innsyn i hvilke opplysninger vi behandler om deg, og å få utlevert en kopi av opplysningene
- å få rettet opplysninger om deg som er feil eller misvisende
- å få slettet personopplysninger om deg
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger

Hvis du har spørsmål til studien, eller ønsker å vite mer om eller benytte deg av dine rettigheter, ta kontakt med masterstudenten via e-post eller telefon (på gresk, engelsk eller norsk). Det er også mulig å ta kontakt med veilederne via epost (på engelsk eller norsk). Du kan også kontakte NTNUs personvernombud Thomas Helgesen (på e-post thomas.helgesen@ntnu.no eller telefon 93 07 90 38). Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med: NSD – Norsk senter for forskningsdata AS på epost (personverntjenester@nsd.no) eller på telefon: 55 58 21 17.

Med vennlig hilsen

Agoritsa Vangelokosta	Yvonne van Baal	Terje Lohndal
Masterstudent	Forsker og Veileder	Professor og Veileder
NTNU	NTNU	NTNU
agoritsv@stud.ntnu.no	yvonne.van.baal@ntnu.no	terje.lohndal@ntnu.no

Appendix D: Consent form

Consent form in Greek:

Έντυπο Συγκατάθεσης

Έχω λάβει και κατανοήσει τις πληροφορίες σχετικά με την μελέτη *Γλωσσική ανάπτυξη σε δίγλωσσα ελληνό-νορβηγόφωνα παιδιά* και είχα την ευκαιρία να κάνω ερωτήσεις. Συγκαταθέτω ότι το παιδί μου μπορεί να συμμετάσχει στην παρούσα μελέτη και ότι τα γλωσσικά δεδομένα και τα ηχητικά αρχεία μπορούν να επεξεργαστούν μέχρι το τέλος της μελέτης περί τις 15 Ιουλίου 2022.

Ονοματεπώνυμο παιδιού:_____

Ονοματεπώνυμο γονέα/κηδεμόνα (με κεφαλαία):_____

Υπογραφή γονέα/κηδεμόνα, Ημερομηνία:_____

Consent form in Norwegian:

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet *Språkutvikling hos gresk-norske tospråklige barn,* og har fått anledning til å stille spørsmål. Jeg samtykker til at mitt barn kan delta i studien og at språklig datamateriale og opplysninger behandles frem til prosjektet er avsluttet, ca. 15. juli 2022.

Navn på barnet:

_____

Navn på foresatt (med blokkbokstaver):

_____

Signatur foresatt, dato:

_____

Appendix E: Parental questionnaire

Parental questionnaire in Greek:

Πληροφορίες για το παιδί

1. Ποιο είναι το ονοματεπώνυμο του παιδιού;
Όνομα: _____ Επώνυμο:_____

2. Ποιο είναι το φύλο του παιδιού;
☐Αγόρι ☐Κορίτσι ☐Άλλο/Δεν απαντώ

3. Πότε γεννήθηκε το παιδί; (ΜΜ-ΧΧΧΧ)
_____

4. Το παιδί γεννήθηκε στην Νορβηγία;
☐Ναι ☐Όχι

4α. Αν όχι, πόσο χρονών (σε μήνες) ήταν το παιδί όταν μετακόμισε στην Νορβηγία;
_____ μηνών.

5. Έχει ζήσει το παιδί σε κάποια χώρα εκτός από την Νορβηγία;
☐Ναι ☐Όχι

5.α. Αν ναι, ήταν αυτή η χώρα η Ελλάδα ή η Κύπρος;
☐Ναι ☐Όχι

5.β. Αν ναι, σε ποια χρονική περίοδο της ζωής του έζησε το παιδί σε αυτή τη χώρα;
Από_____ μηνών μέχρι _____ μηνών.

6. Ποια/ Ποιες γλώσσα/ες μιλάει το παιδί; Παρακαλώ επιλέξτε όλες τις επιλογές που ισχύουν.
☐ελληνικά ☐νορβηγικά ☐άλλη: _____

7. Πάει το παιδί στο νηπιαγωγείο;
☐Ναι ☐Όχι

7.α. Αν όχι, έχει πάει το παιδί στο νηπιαγωγείο;
☐Ναι ☐Όχι

7.β. Σε ποια χρονική περίοδο της ζωής του πήγε το παιδί στο νηπιαγωγείο;
Από _____ μηνών μέχρι _____ μηνών.

7.γ. Ποια/ Ποιες γλώσσα/ες χρησιμοποιεί το νηπιαγωγείο; Παρακαλώ επιλέξτε όλες τις επιλογές που ισχύουν.
☐ελληνικά ☐νορβηγικά ☐άλλο: _____ ☐άλλο: _____

8. Πάει το παιδί σε δημοτικό σχολείο;
☐Ναι ☐Όχι

8.α. Αν ναι, ποια/ ποιες γλώσσα/ες χρησιμοποιεί το δημοτικό σχολείο; Παρακαλώ επιλέξτε όλες τις επιλογές που ισχύουν.
☐ελληνικά ☐νορβηγικά ☐άλλη: _____ ☐άλλη: _____

9. Παρακολουθεί το παιδί ελληνικό σχολείο ή ελληνικό κατηχητικό;
☐Ναι ☐Όχι ☐Έχει παρακολουθήσει στο παρελθόν

9.α. Αν ναι, πόσες ώρες την εβδομάδα;
_____

10. Ξέρει το παιδί να διαβάζει;
☐Ναι, στα ελληνικά ☐Ναι, στα νορβηγικά ☐Ναι, και στις δύο γλώσσες ☐Όχι

11. Ξέρει το παιδί να γράφει;

☐Ναι, στα ελληνικά ☐Ναι, στα νορβηγικά ☐Ναι, και στις δύο γλώσσες ☐Όχι

12. Έχει το παιδί αδέρφια;

☐Ναι ☐Όχι

12.α. Αν ναι, έχει μεγαλύτερα αδέρφια, μικρότερα αδέρφια ή και τα δύο;

☐Μεγαλύτερα ☐Μικρότερα ☐Και τα δύο

12.β. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί το παιδί με τα αδέρφια του;

☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

13. Ποια/Ποιες γλώσσα/ες χρησιμοποιείτε σαν οικογένεια;

☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

Πληροφορίες για τους γονείς/κηδεμόνες

Θα θέλαμε επίσης να κάποιες πληροφορίες για την γλώσσα των γονιών/κηδεμόνων των παιδιών. Αν το παιδί περνάει χρόνο με περισσότερους από δύο γονείς ή κηδεμόνες, θα θέλαμε κάποιες πληροφορίες και για εκείνους. Σε αυτή την περίπτωση συμπληρώστε πρώτες τις πληροφορίες του γονιού ή του κηδεμόνα με τον οποίο το παιδί περνάει τον περισσότερο χρόνο.

Γονιός/Κηδεμόνας ν.1

14. Ποια είναι η συγγένεια/σχέση του γονιού/κηδεμόνα με το παιδί (πχ. μητέρα, πατέρας, παππούς/γιαγιά, νταντά, θεία, κλπ.);

_____

15. Μιλάει ο γονιός/κηδεμόνας ελληνικά;

☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

16. Μιλάει ο γονιός/κηδεμόνας νορβηγικά;

☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

17. Έχει ο γονιός/κηδεμόνας κάποια μητρική γλώσσα εκτός των ελληνικών ή/και των νορβηγικών;

☐Όχι ☐Ναι: _____

18. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **ο γονιός/κηδεμόνας** με το παιδί;

☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά

☐Πάντα νορβηγικά
☐Άλλη: _____

19. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **το παιδί** με τον γονιό/κηδεμόνα;
☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

20. Ποιο είναι το υψηλότερο επίπεδο εκπαίδευσης που έχει ολοκληρώσει ο γονιός/ κηδεμόνας;
☐Γυμνάσιο
☐Λύκειο
☐Ανώτατη εκπαίδευση

Γονιός/Κηδεμόνας ν.2

21. Ποια είναι η συγγένεια/σχέση του γονιού/κηδεμόνα με το παιδί (πχ. μητέρα, πατέρας, παππούς/γιαγιά, νταντά, θεία, κλπ.);
_____

22. Μιλάει ο γονιός/κηδεμόνας ελληνικά;
☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

23. Μιλάει ο γονιός/κηδεμόνας νορβηγικά;
☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

24. Έχει ο γονιός/κηδεμόνας κάποια μητρική γλώσσα εκτός των ελληνικών ή/και των νορβηγικών;
☐Όχι ☐Ναι: _____

25. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **ο γονιός/κηδεμόνας** με το παιδί;
☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

26. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **το παιδί** με τον γονιό/κηδεμόνα;
☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

27. Ποιο είναι το υψηλότερο επίπεδο εκπαίδευσης που έχει ολοκληρώσει ο γονιός/ κηδεμόνας;
☐Γυμνάσιο
☐Λύκειο
☐Ανώτατη εκπαίδευση

Γονιός/Κηδεμόνας ν.3

28. Ποια είναι η συγγένεια/σχέση του γονιού/κηδεμόνα με το παιδί (πχ. μητέρα, πατέρας, παππούς/γιαγιά, νταντά, θεία, κλπ.);

_____

29. Μιλάει ο γονιός/κηδεμόνας ελληνικά;
☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

30. Μιλάει ο γονιός/κηδεμόνας νορβηγικά;
☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

31. Έχει ο γονιός/κηδεμόνας κάποια μητρική γλώσσα εκτός των ελληνικών ή/και των νορβηγικών;
☐Όχι ☐Ναι: _____

32. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **ο γονιός/κηδεμόνας** με το παιδί;
☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

33. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **το παιδί** με τον γονιό/κηδεμόνα;
☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

34. Ποιο είναι το υψηλότερο επίπεδο εκπαίδευσης που έχει ολοκληρώσει ο γονιός/ κηδεμόνας;
☐Γυμνάσιο
☐Λύκειο
☐Ανώτατη εκπαίδευση

Γονιός/Κηδεμόνας ν.4

35. Ποια είναι η συγγένεια/σχέση του γονιού/κηδεμόνα με το παιδί (πχ. μητέρα, πατέρας, παππούς/γιαγιά, νταντά, θεία, κλπ.);

_____

36. Μιλάει ο γονιός/κηδεμόνας ελληνικά;
☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

37. Μιλάει ο γονιός/κηδεμόνας νορβηγικά;
☐Όχι ☐Λίγα ☐Αρκετά καλά ☐Πολύ καλά ☐Άπταιστα ☐Μητρική γλώσσα

38. Έχει ο γονιός/κηδεμόνας κάποια μητρική γλώσσα εκτός των ελληνικών ή/και των νορβηγικών;
☐Όχι ☐Ναι: _____

39. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **ο γονιός/κηδεμόνας** με το παιδί;
☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

40. Ποια/Ποιες γλώσσα/ες χρησιμοποιεί **το παιδί** με τον γονιό/κηδεμόνα;
☐Πάντα ελληνικά
☐Κυρίως ελληνικά
☐Τόσο ελληνικά όσο και νορβηγικά
☐Κυρίως νορβηγικά
☐Πάντα νορβηγικά
☐Άλλη: _____

41. Ποιο είναι το υψηλότερο επίπεδο εκπαίδευσης που έχει ολοκληρώσει ο γονιός/ κηδεμόνας;
☐Γυμνάσιο
☐Λύκειο
☐Ανώτατη εκπαίδευση

Εάν έχετε σχόλια για το ερωτηματολόγιο ή θέλετε να δώσετε περισσότερες πληροφορίες για κάποια ερώτηση μπορείτε να το κάνετε εδώ:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Ευχαριστούμε για την συμμετοχή σας!

Parental questionnaire in Norwegian:

Bakgrunnsinformasjon om barnet

1. Hva er barnets navn?
Fornavn: _____ Etternavn**:**
_____

2. Hva er barnets kjønn?
☐Gutt ☐Jente ☐Annet/Vil ikke oppgi

3. Når ble barnet født? (MM-ÅÅÅÅ)
_____

4. Ble barnet født i Norge?
☐Ja ☐Nei

4a. Hvis nei, hvor gammel (antall måneder) var barnet når det flyttet til Norge**?**
_____ måneder.

5. Har barnet bodd i et annet land enn Norge?
☐Ja ☐Nei

5.a. Hvis ja, var dette landet Hellas eller Kypros?
☐Ja ☐Nei

5.b. Hvis ja, i hvilken aldersperiode bodde barnet i dette landet?
Fra_____ måneder til _____ måneder.

6. Hvilket/Hvilke språk snakker barnet? Kryss av for alle aktuelle språk.
☐gresk ☐norsk ☐annet: _____

7. Går barnet i barnehage?
☐Ja ☐Nei

7.a. Hvis nei, har barnet gått i barnehage?
☐Ja ☐Nei

7.b. I hvilken aldersperiode gikk barnet i barnehage?
Fra _____ måneder til
_____ måneder.

7.c. Hvilket\Hvilke språk bruker barnehagen? Kryss av for alle aktuelle språk.
☐gresk ☐norsk ☐annet: _____ ☐annet: _____

8. Går barnet i barneskole?
☐Ja ☐Nei

8.a. Hvilket\Hvilke språk bruker barneskolen? Kryss av for alle aktuelle språk.
☐gresk ☐norsk ☐annet: _____ ☐annet: _____

9. Går barnet på gresk skole eller gresk søndagsskole?
☐Ja ☐Nei ☐Har gått tidligere

9.a. Hvis ja, hvor mange timer per uka?

_____

10. Kan barnet lese?

☐Ja, på gresk ☐Ja, på norsk ☐Ja, på begge språk ☐Nei

11. Kan barnet skrive?

☐Ja, på gresk ☐Ja, på norsk ☐Ja, på begge språk ☐Nei

12. Har barnet søsken?

☐Ja ☐Nei

12.a. Hvis ja, har barnet eldre søsken, yngre søsken eller begge deler?

☐Eldre ☐Yngre ☐Begge deler

12.b. Hvilket\Hvilke språk bruker barnet med søsken\e sin\e?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk

13. Hvilket\Hvilke språk bruker dere som familie?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk
☐Annet: _____

Bakgrunnsinformasjon om foresatte

Vi vil også vite litt om språket til barnets foresatte. Hvis barnet i hverdagen forholder seg til flere enn to foresatte, vil vi ha informasjon om dem også. Da vil vi at foresatte barnet er mest sammen med, nevnes først.

Foresatt nr. 1

14. Hva er forholdet til barnet (f.eks. mor, far, besteforelder, barnevakt, tante, etc

_____

15. Snakker foresatt gresk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

16. Snakker foresatt norsk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

17. Har foresatt et morsmål annet enn gresk og\eller norsk?

☐Nei ☐Ja: _____

18. Hvilket\Hvilke språk bruker **foresatt** med barnet?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk

☐Annet: _____

19. Hvilket\Hvilke språk bruker **barnet** med foresatt?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk
☐Annet: _____

20. Hva er den høyeste utdannelsesnivå foresatt har fullført?

☐Grunnskole
☐Videregående utdanning
☐Høyere Utdanning

Foresatt nr. 2

21. Hva er forholdet til barnet (f.eks. mor, far, besteforelder, barnevakt, tante, etc

_____

22. Snakker foresatt gresk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

23. Snakker foresatt norsk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

24. Har foresatt et morsmål annet enn gresk og\eller norsk?

☐Nei ☐Ja: _____

25. Hvilket\Hvilke språk bruker **foresatt** med barnet?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk
☐Annet: _____

26. Hvilket\Hvilke språk bruker **barnet** med foresatt?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk
☐Annet: _____

27. Hva er den høyeste utdannelsesnivå foresatt har fullført?

☐Grunnskole
☐Videregående utdanning
☐Høyere Utdanning

Foresatt nr. 3

28. Hva er forholdet til barnet (f.eks. mor, far, besteforelder, barnevakt, tante, etc

_____

29. Snakker foresatt gresk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

30. Snakker foresatt norsk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

31. Har foresatt et morsmål annet enn gresk og\eller norsk?

☐Nei ☐Ja: _____

32. Hvilket\Hvilke språk bruker **foresatt** med barnet?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk
☐Annet: _____

33. Hvilket\Hvilke språk bruker **barnet** med foresatt?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk
☐Annet: _____

34. Hva er den høyeste utdannelsesnivå du har fullført?

☐Grunnskole
☐Videregående utdanning
☐Høyere Utdanning

Foresatt nr. 4

35. Hva er forholdet til barnet (f.eks. mor, far, besteforelder, barnevakt, tante, etc

_____

36. Snakker foresatt gresk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

37. Snakker foresatt norsk?

☐Nei ☐Litt ☐Ganske godt ☐Veldig godt ☐Flytende ☐Morsmål

38. Har foresatt et morsmål annet enn gresk og\eller norsk?

☐Nei ☐Ja: _____

39. Hvilket\Hvilke språk bruker **foresatt** med barnet?

☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk

☐Alltid norsk
☐Annet: _____

40. Hvilket\Hvilke språk bruker **barnet** med foresatt?
☐Alltid gresk
☐Hovedsakelig gresk
☐Like mye gresk og norsk
☐Hovedsakelig norsk
☐Alltid norsk
☐Annet: _____

41. Hva er den høyeste utdannelsesnivå du har fullført?
☐Grunnskole
☐Videregående utdanning
☐Høyere Utdanning

Har du kommentarer til skjema eller vil du gi mer informasjon til et svar, kan du skrive dem her:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Takk for at du deltar!

Appendix F: The Shapiro-Wilk normality test results

The data for the omission of Greek indefinite articles are not normally distributed (Shapiro-Wilk test: $W=0.72446$, $p<0.0001$), and neither are the data for the omission of Greek definite articles (Shapiro-Wilk normality test: $W=0.78355$, $p<0.001$)

The data for the overall gender agreement in the indefinite condition in Greek are not normally distributed (Shapiro-Wilk test: $W=0.86991$, $p=0.01439$), and neither are the data for the overall gender agreement in the definite condition in Greek (Shapiro-Wilk test: $W=0.70019$, $p<0.001$)

The data for the accuracy of agreement in the masculine gender in the indefinite condition in Greek are not normally distributed (Shapiro-Wilk test: $W=0.76937$, $p<0.001$), and neither are the data for the accuracy of agreement in the masculine gender in the definite condition in Greek (Shapiro-Wilk test: $W=0.63884$, $p<0.0001$)

The data for the accuracy of agreement in the feminine gender in the indefinite condition in Greek are not normally distributed (Shapiro-Wilk test: $W=0.5383$, $p<0.00001$), and neither are the data for the accuracy of agreement in the feminine gender in the definite condition in Greek (Shapiro-Wilk test: $W=0.50982$, $p<0.00001$)

The data for the accuracy of agreement in the neuter gender in the indefinite condition in Greek are not normally distributed (Shapiro-Wilk test: $W=0.24394$, $p<0.00000001$), and neither are the data for the accuracy of agreement in the neuter in the definite condition in Greek (Shapiro-Wilk test: $W=0.27265$, $p<0.0000001$)

The data for the omission of indefinite articles in Norwegian are not normally distributed (Shapiro-Wilk test: $W=0.66527$, $p<0.00001$), and the same is true for the omission of definite suffixes (Shapiro-Wilk test: $W=0.79136$, $p<0.001$)

The data for the overall gender agreement in the indefinite condition in Norwegian are not normally distributed (Shapiro-Wilk test: $W=0.78952$, $p<0.001$), and neither are the data for the overall gender agreement in the definite condition in Norwegian (Shapiro-Wilk test: $W=0.5681$, $p<0.00001$)

The data for the accuracy of agreement in the neuter gender in the indefinite condition in Norwegian are not normally distributed (Shapiro-Wilk test:

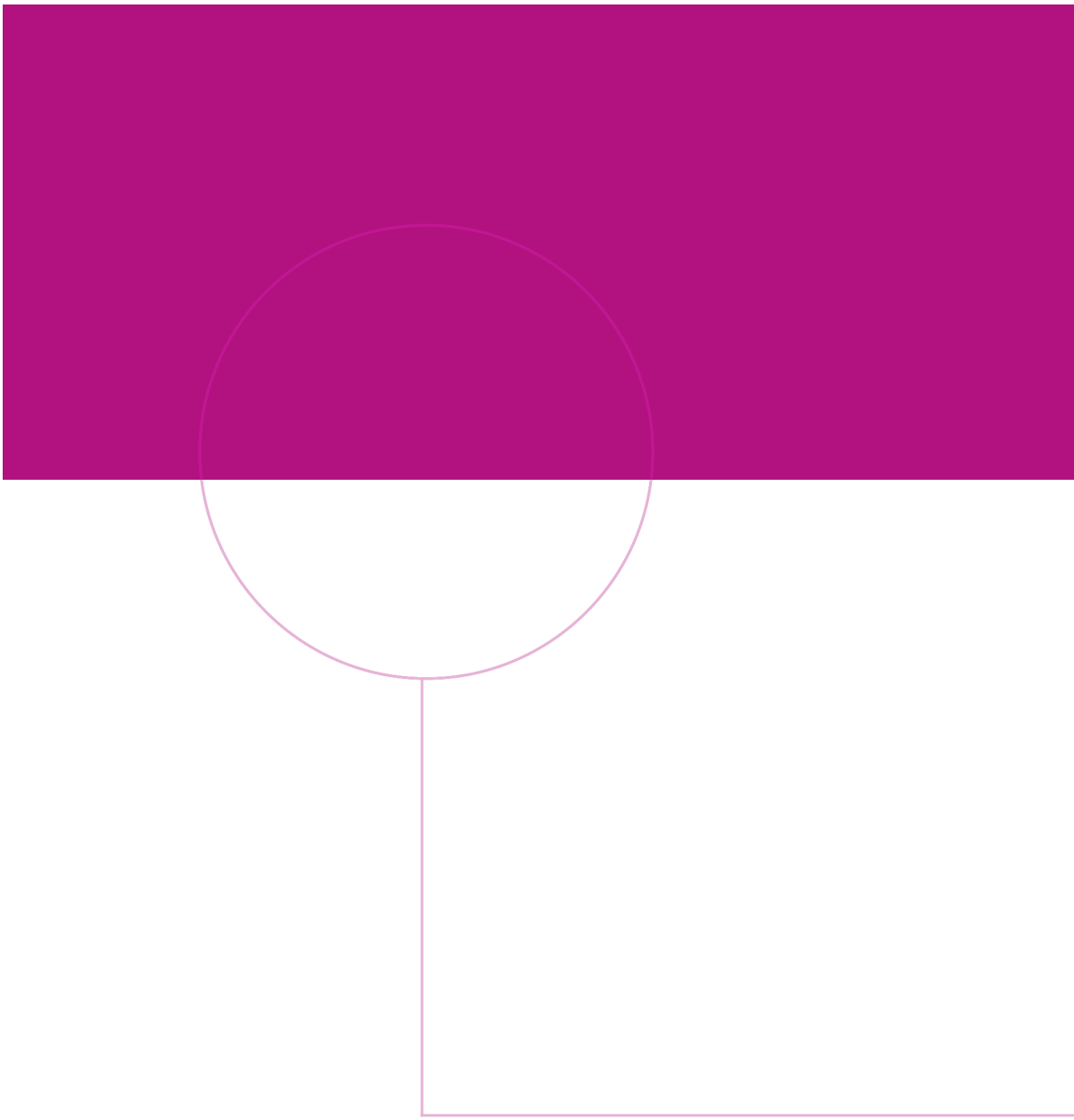
W=0.77368, p<0.001), and neither are the data for the accuracy of agreement in the neuter in the definite condition in Norwegian (Shapiro-Wilk test: W=0.62393, p<0.0001)

The data for the omission of indefinite articles in the Greek nonce noun experiment are not normally distributed (Shapiro-Wilk test: W=0.81812, p<0.01).

The data for the omission of definite articles in the Greek nonce noun experiment are not normally distributed (Shapiro-Wilk test: W=0. 87838, p=0.04487).

The data for the omission of indefinite articles in the Norwegian nonce noun experiment are not normally distributed (Shapiro-Wilk test: W=0.73648, p<0.001).

The data for the omission of the definite suffix in the Norwegian nonce noun experiment are not normally distributed (Shapiro-Wilk test: W=0.59254, p<0.00001).



NTNU

Norwegian University of
Science and Technology