Language skills in Greek-English bilingual children attending Greek supplementary schools in England

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ABSTRACT
Many parents in the UK enrol their children in Greek supplementary schools so the children can learn and maintain the Greek language and culture in parallel with English mainstream education. Despite fears about the effects of this heritage language (Greek) use on children’s skills in the majority language (English), research on these somewhat hidden schools to date is limited and qualitative in nature. The current study is the first quantitative study which examines the effect of attending a Greek supplementary school on the vocabulary and grammar scores of Greek-English bilingual children. We administered a battery of language tests in both languages to 31 Greek-English bilingual children, aged 5–13 years, and closely looked at the participants’ language history using parental questionnaires. Using multiple regression analyses we examine the relationship between relevant variables, such as language use and years in supplementary school and we find that the higher the use of Greek, the higher the scores in the Greek language tasks, although no significant relationship was detected between years in supplementary school and the development of language skills. Crucially, the use of Greek does not negatively predict scores in the English language tasks. Implications of our results and future directions are discussed.

1. Introduction
From July 2018 to June 2019, the estimated number of Greek nationals who were residents in the UK was 74,000 (Office for National Statistics 2020), 43,000 more compared to 2009, a rise which was primarily a result of the 2010 government-debt crisis in Greece (Karatsareas 2020, 2021a). By the end of 2020, 102,330 applications from Greek citizens residing in the UK were approved for the EU Settlement Scheme in order to obtain settled and pre-settled status (Pratsinakis, Kafe, and Serôdio 2021). More than a quarter of this population have children, 47.9% of whom were born in the UK (Pratsinakis, Kafe, and Serôdio 2021). Many of these parents wish to provide their children the opportunity to attend Greek supplementary schools in the UK in order to learn and maintain their heritage language in parallel with their English mainstream education.

The amount and nature of language exposure seem to be vital in the development of language skills (e.g. Hoff et al. 2012). Though vocabulary and grammar skills have been assessed in several bilingual populations speaking a majority and minority language (e.g. Hoff 2018) in relation to a number of associated variables such as age, language exposure and socioeconomic status (SES), and despite this rise in Greek nationals and their children in the UK (Karatsareas 2021a, 2021b), to the best of our knowledge, no other study has explored the role of the exposure to a supplementary educational setting on the Greek and English language skills of Greek-English bilingual children.
In this study, we address the role of supplementary educational setting on the Greek and English language skills of Greek-English bilingual children. We aim to investigate Greek and English receptive and expressive vocabulary skills as well as the receptive grammar skills in relation to a number of related variables such as age, language use and SES, of an understudied group of Greek-English bilingual children living in England and attending both English mainstream and Greek supplementary schools.

1.1. Supplementary schools

Supplementary schools, also known as complementary, heritage, or Saturday schools, support and maintain the language and culture of many immigrant communities in countries such as the USA, the UK, Canada, South Africa and Australia. These schools have been called ‘hidden’ schools by Aravossitas (2016) since the language of immigrant communities in such countries is categorised as non-official and is often not supported or is ignored by the authorities.

More specifically in the UK, the educational system for over half a century has recognised the existence of children whose parents speak another language, such as Turkish, Chinese or Greek, namely heritage language speakers, and has provided a range of languages at GCSE and A level (Wei 2006). This preparation of pupils to sit examinations in the various community languages in which these or other, foreign language qualifications are offered, is the key aspect of supplementary schools. These qualifications are viewed as formal recognition and legitimisation of their languages (Matras and Karatsareas 2020). There are an estimated 3000–5000 such schools in England (NRCSE 2020).

The main reason for the existence of these schools in the UK was the wish to maintain the language and customs of the country of origin by minority ethnic community members as well as maintain their cultural identity and traditions, linked in many cases to religion (Creese et al. 2006). As a result, isolation is reduced amongst minority ethnic groups, an aim which is particularly evident in Greek (Pillas 1992), Turkish (e.g. Lytra 2012), Chinese (Creese, Wu, and Wei 2007) and newly arrived refugee family (Rutter 1998, 2003) supplementary schools. The first group of supplementary schools emerged in the late 1960s for children of Afro-Caribbean families, because of their dissatisfaction with mainstream education and how it failed to reflect the culture of the Afro-Caribbean community as well as due to the limited representation of the Afro-Caribbean community in education and positions of authority (Chevannes and Reeves 1987).

A second wave of supplementary schools occurred in the late 1970s and early 1980s by Muslim communities originating from South Asia and Africa. These schools were established for religious reasons closely intertwined with language, in line with Anglican, Catholic or Jewish communities, who were able to have their own schools. During the 1990s, and after controversy regarding the education of Muslim children, the education of their teachers and the official recognition and support of the two first Muslim schools, a number of other immigrant communities began to establish their own supplementary schools in order to maintain their language and culture. For example, the Chinese, the Turkish, and the Greek communities founded a noteworthy number of schools in England and Scotland for their British-born generations (Wei 2006). These schools included weekend or afternoon classes outside of normal school hours and they were truly complementary since their founders did not ask for separate mainstream education in their languages. In the current study, we will be focusing on a Greek supplementary school in the UK.

1.2. The Greek community and Greek educational provision in the UK

Due to historical and political circumstances in the past, many Greek-speaking individuals from Greece and Cyprus moved to the UK. The majority of these Greek-speaking communities in the UK used to consist mostly of people of Greek Cypriot origin (Paraskevopoulos 2012), who use both standardised and non-standardised varieties of Greek and English in contrast to individuals...
from the Greek mainland who mostly use the Standard Greek variety (Karatsareas 2021b). Immigrants from the Greek mainland created churches and Greek supplementary schools, which were later used by Greek Cypriot migrants to maintain a cultural identity (Metis 1993). The motivation underlying the establishment of these communities and as an extension of these schools is that of ethnicity, as per Raveau’s (1987) definition of ethnicity: ‘... the awareness – felt or recognised – of belonging to a group related to a historical or mythical past that can be projected into a possible or utopian common destiny. It is expressed in terms of seven indicators of participation or recognition: biogenetic, territorial, linguistic, economic, religious, cultural and political’ (Raveau 1987, 105). In this case, the aim of the Greek supplementary schools is to preserve, shape and communicate the Greek identity, language and culture (Cyprus Ministry of Education, Culture, Sport and Youth 2018) in the Greek-speaking community in the UK.

Until the beginning of the twenty-first century, the Greek population in the UK consisted of prosperous people involved with shipping and banking, an increasing population of Greek professionals, such as academics, lawyers and doctors, and a big number of university students (Pratsinakis, Kafe, and Serôdio 2021). There were there 10–12,000 bankers and shippers by 2006, who were mostly concentrated in London (Harlaftis 2006). The Greek student population was 22,485 in 2002/2003 with two-thirds pursuing undergraduate studies (Koniordos 2017). However, due to changes in the entry criteria for Greek universities, the rise in undergraduate tuition fees for EU students and the consequences of the crisis on Greek salaries (Karatsareas 2021b) this number decreased to 9920 in 2018/2019 (Higher Education Statistics Agency 2020). In 2015/2016, around three quarters of Greek students were postgraduate students (Koniordos 2017). It is estimated that between the period of 1998–2007, a total of 550,000 Greek citizens (7.3% of the active population) migrated abroad in order to engage in high skilled professional jobs (Rombolis 2007). In 2001, 35,000 Greek born people were residing in the UK and 36,769 in 2011 (Pratsinakis, Kafe, and Serôdio 2021).

From July 2018 to June 2019, the estimated number of Greek nationals who were residents in the UK, excluding students living in halls, was 74,000 (Office for National Statistics 2020), 43,000 more compared to 2009. This is a massive rise compared to an estimate of 26,000 in 2008, 33,000 in 2012, 42,000 in 2013, 54,000 in 2014, and 62,000 in 2016. Between 28 August 2018–30 June 2020, 76,590 Greek nationals had a successful EU Settlement Scheme application for pre-settled (47,590 Greek nationals had less than 3 years in the UK) and settled status (29,000 Greek nationals had over 5 years in the UK without any absence over 6 months in a 12-month period; GOV.UK 2020). In December 2020, 102,330 applications were made from Greek nationals to get pre-settled or settled status (Pratsinakis, Kafe, and Serôdio 2021). This rise can be explained by the unemployment rate in Greece, which grew from 7.7% in September 2008 to a record high, 27.8% in September 2013, with the youth unemployment rate of 59.5% at its peak in the first quarter of 2013 (European Parliament 2015). Greek scientists living abroad stated that Greece cannot guarantee their future as a scientist, and they could not progress in the career in Greece. Due to the economic crisis, they had no choice but to leave their country for a better future (Theodoropoulos et al. 2014), a better work environment, a job that would fit their skills and ambitions or offer them opportunities for professional development, higher salaries, financial independence and a lack of meritocracy in Greece, a better future for their children or reuniting with partners (Pratsinakis, Kafe, and Serôdio 2021, 14). This is the so-called ‘new’ Greek migration, that is, the rise in the migration of first-generation Greek nationals and their children to the UK due to the 2010 government-debt crisis. The UK was the second most popular destination, after Germany, as a result of this crisis (Pratsinakis, Kafe, and Serôdio 2021).

It is evident from these numbers that some of these people may have brought their children to the UK or may have created families in the UK. Indeed, based on Pratsinakis (2019; as cited in Karatsareas 2021a) 57% who were parents migrated with their whole family, 31% formed their families in the UK, and 73% of the migrants left Greece with their families. More than a quarter of the Greek migrants in the UK have children, of which 47.9% were born in the UK. Some of them might create families in the future since more than 44.6% of this adult population is aged under 35. At the
moment, especially outside London, there is a rise in first-generation Greek nationals and their children compared to Greek Cypriot second- and third-generation residents in the UK attending Greek supplementary schools. The dynamic has changed recently, namely children born in Greece that possibly have attended Greek mainstream schools for some years, have relocated to the UK with their parents, due to the 2010 government-debt crisis (also see Karatsareas 2020), while other children were born in the UK and have been acquiring Greek as a first language from first-generation Greek-speaking parents. Also, parents who had migrated to Greece from other countries, such as Albania, Georgia, Ukraine, Bulgaria, during the previous two decades and have moved to the UK due to the 2010 government-debt crisis are choosing to use their second language, Greek in the home. The above children together with children of Greek Cypriot origin residing in the UK (Karatsareas 2021b) attend supplementary schools creating classrooms of diverse skills and needs (Lytra 2019). This new wave of Greek speakers has distinct characteristics compared to the Greek-speaking populations that arrived in the UK in previous decades and reside until now. 75% of these new migrants have an undergraduate degree and the majority has pursued postgraduate and doctoral studies (Pratsinakis, Kafe, and Serôdio 2021). Another particularly crucial factor is that these new Greek migrants intend to stay, since 48% of those who migrated with their families to the UK after 2010 do not intend to return to Greece or intend to return after they retire (Pratsinakis, Kafe, and Serôdio 2021). This percentage rises to 71% for those residing in London (Pratsinakis 2019) and decreases to 25% for those without children. These numbers underline the importance of supplementary school in the maintenance of the Greek language and culture for these families.

The official Greek state is responsible for the provision of Greek Education to children of Greek origin who live outside of Greece all over the world (Greek Ministry of Education and Religious Affairs 2021). In the UK, the Ministry of Education, Culture, Sport and Youth of Cyprus and the Greek Ministry of Education and Religious Affairs together with the Greek communities and the Greek Orthodox Church of Great Britain are responsible for this provision (Paraskevopoulos 2012), although there is variability in the sharing of these responsibilities. This provision includes preparing and providing teaching material and assigning staff on secondment to schools worldwide. The teachers and managers of these schools are members of the community themselves. In some schools, there might be teachers who are sent by the communities’ countries of origins for a specific period (e.g. 5 years) to serve in the supplementary schools. The operation of supplementary schools is linked to the language policies and practices in the home countries (Matras and Karatsareas 2020). There are positive outcomes of attending these schools, such as achieving good results in A Level examinations in the UK, something evident within the Greek community (Karadjia-Stavlioti 1997).

There are several Greek bilingual education establishments in the U.K with the aim of maintaining the Greek identity. Most specifically, Greek communities run their own part time supplementary schools in churches and community centres or in classrooms rented out from mainstream schools during the weekend or in the afternoon. Classes usually take place on Saturday or Sunday mornings and/or weekday evenings (Matras and Karatsareas 2020; Pantazi 2008). The schools are run by the Greek Embassy in London, the Unified Forum for the Greek Education in the United Kingdom, the Greek Independent Schools of London, Private Greek schools (Nostos n.d.) and Cyprus Educational Mission, a London-based unit of the Ministry of Education and Culture of the Republic of Cyprus (Matras and Karatsareas 2020; Pantazi 2008). These authorities act as a link between the home country and diaspora. There are also mainstream schools, namely the Greek Nursery, Primary School and High School of London, where pupils are taught via the Greek medium, based on the Greek curriculum with daily classes in the English language. There are also two independent Greek-English Orthodox bilingual schools, one primary and one high school in North London (Hellenic Education Office 2016). The total number of these establishments is 108 (Nostos n.d.). Based on a 1997 report, 10,230 children of Greek heritage were attending 70 supplementary schools. Most of these schools were in north London, where the majority of the Greek community is concentrated (Karadjia-Stavlioti 1997). However, information is spread across various outdated websites, with no dates and no central information point for Greek-speaking UK residents.
Since 2013/2014 there has been an increase in enrolments due to this post-2010 wave of Greek migrants. There were 5300 enrolments in 2012/2013 and 6071 in 2018/2019 (Republic of Cyprus, Ministry of Education and Culture as cited in Karatsareas 2021a). Based on the Cyprus Education Mission (2020), during 2019/2020, 64 Greek supplementary schools operated in the UK 5972 students attended Greek supplementary schools in a total of 25 schools in London and 39 schools in other parts of the UK (CEM 2020; as cited in Voskou 2021).

1.3. Previous studies

In other bilingual education settings, such as Immersion education classrooms, there has been a strand of literature exploring the effect of the educational context on language skills (e.g. Bialystok and Barac 2012; Goriot et al. 2018; Rhys and Thomas 2013; Simonis et al. 2020), whereas no research to our knowledge has quantitatively explored the effects of exposure to a supplementary education context on both language skills of bilingual children.

Bialystok (2008) mentions the importance of the context where bilingualism or L2 acquisition occurs, such as the educational context; however, studies often neglect this factor. Children attend different types of educational programs throughout their everyday lives and acquire information in different acquisition contexts. Due to immigration, many children for whom English is not their first language attend state schools in the UK. In addition to state schools, they might attend heritage language programs or supplementary schools after mainstream school, usually twice a week, to maintain their home language and culture (see Paraskevopoulos 2012). However, the supplementary school educational setting that bilinguals attend and its relation to language skills, such as vocabulary and grammar, is an aspect that has not been researched thoroughly to the best of our knowledge.

A small number of quantitative studies have investigated the role of the educational setting in bilingual language development. Bialystok (2010) investigated English receptive vocabulary and observed that bilingual children in English medium schools with a non-English language at home were comparable to monolingual counterparts in their responses regarding words associated with schooling while comprehension of words primarily associated with home was better in monolinguals. However, research rarely controls for which language is used in school, even though vocabulary size is a predictor of children’s performance on tests of academic achievement such as spelling, reading and arithmetic (Smith, Smith, and Dobbs 1991).

A few studies to date have compared bilinguals who are instructed in different languages to assess the effects on language (e.g. Barac and Bialystok 2012). More specifically, Barac and Bialystok (2012) investigated the role of cultural background, language similarity and language of education on the language and cognitive effects of bilingualism. They compared 78 bilingual, six-year-old children, whose two languages were English plus Chinese, French, or Spanish, to a group of 26 English monolingual children. Their findings suggest that cognitive benefits of bilingualism are not affected by the language of schooling, cultural backgrounds and language similarity. In contrast, the scores in the grammar, vocabulary and metalinguistic awareness tasks were affected by language similarity and language of schooling. The groups did not differ in the amount of language exposure and production in the home. All children lived in an English-speaking community; however, the Spanish and Chinese bilingual groups were educated in English and the French bilingual group in French. The Spanish bilingual group outperformed the French bilingual group on all three tasks and the Chinese bilingual group on the vocabulary and metalinguistics awareness task. Only the Spanish-English bilingual children performed comparably to English monolinguals in the English receptive vocabulary and grammar task while the performance of all other bilingual groups was lower than the monolingual group, indicating that both language similarity and language of schooling play a role in linguistic tasks.

The amount and nature of language exposure have been shown to play a crucial role in the development of language skills (e.g. De Houwer 2009; Gathercole and Thomas 2009; Hoff et al. 2012).
Children acquiring two languages, who have less exposure to each of the two languages, compared to monolingual control groups, have often been shown to acquire each language at a slower rate (e.g. Hoff et al. 2012). However, language dominance might shift towards the majority language after the children enter school and vocabulary and grammar skills might be affected in different ways. Thordardottir (2011) investigated vocabulary acquisition and its relation to the amount of bilingual exposure in five-year-old simultaneous French-English bilingual children in Canada, finding a strong relationship. Duursma et al. (2007) found similar results in Year 5 children’s minority language, Spanish, in the USA. In order to support Spanish vocabulary skills, both Spanish support in the home as well as in the classroom was necessary (Duursma et al. 2007). Similarly, Chondrogianni and Marinis (2011) found that L2 receptive vocabulary and complex syntax skills of 6-to-9-year-old sequential Turkish-English bilingual children attending mainstream schools in the UK were predicted by use of English in the home and maternal English proficiency. Length of exposure to the L2 and maternal English proficiency predicted general grammatical abilities.

During the last few years, there have been qualitative studies including various Arabic, Chinese, Bengali, Bulgarian, Urdu, Polish, Ukrainian, Greek supplementary schools or establishments in the UK and around the world, focusing on classroom practices such as translanguaging, (e.g. Creese and Blackledge 2010; Faltzi 2011; Garcia and Wei 2014; Hua, Wei, and Jankowicz-Pytel 2020; Liu and Fang 2020), on teacher, parent and pupil identities and perspectives towards supplementary education (e.g. Androulakis et al. 2018; Archer, Francis, and Mau 2009; Creese et al. 2006; Gkaintartzi, Chatzidaki, and Tsokalidou 2014; Karatsareas 2018; Kirsch 2019; Liao and Larke 2008; Panagiotopoulou, Rosen, and Garcia 2016; Sook Lee and Oxelson 2006; Strand 2007), on language provisions and pedagogy (e.g. Alexandrova-Kirova 2017; Cummins 2006; Gaiser and Hughes 2015; Pantazi 2006, 2008; Reed et al. 2020; Walters 2011) and on social change and history pedagogy (Voskou 2018, 2019, 2021). However, no quantitative study to date has investigated the effect of amount of exposure to a supplementary school setting on language skills.

Regarding the Greek heritage school situation, and after this mass movement from mainland Greece to the UK, there has been only one study assessing how language use might affect receptive and expressive vocabulary and grammar skills in Greek-English bilingual pupils in the London, Reading and Oxford area (Papastefanou, Powell, and Marinis 2019). However, this study does not test if length of exposure to the Greek supplementary school setting has a relationship to the performance in these language tasks. More specifically, Papastefanou, Powell, and Marinis (2019) tested 40 Greek-English bilingual children in Year 1 and Year 3 on vocabulary, phonological awareness, morphological awareness, morphosyntax, and decoding in both languages. The results showed that as a group, the children were Greek dominant before the age of 4 but English dominant now and confirm that language dominance could change even before children enter school and affect language and literacy skills equally. Language use and test scores were strongly correlated in the heritage language, Greek, which highlights the importance of parental language use in the heritage language. The Greek language had no negative effect on children’s language and reading performance in English.

1.4. The present study

In this study, we will be addressing the role of supplementary educational setting on the Greek and English language skills of Greek-English bilingual children. To the best of our knowledge, no other study has explored this. We aim to investigate Greek and English receptive and expressive vocabulary skills as well as the receptive grammar skills of Greek-English bilingual children living in England and attending both English mainstream and Greek supplementary schools in the North of England, which has not been previously studied. Studying this population is of increasing importance, since there is a rise in first-generation Greek nationals and their children who have moved to the UK with their parents due to the 2010 government-debt crisis (also see Karatsareas 2020). We aim to examine the relationship between variables linked to bilingualism, such as general lifetime language use, and
vocabulary and grammar skills both in the majority (English) and heritage language (Greek). To address these aims we administered a battery of tests in both languages and closely looked at the participants’ language backgrounds.

The research questions were:

1. What variables predict performance in Greek and English language tasks?
2. Does the length of attending a supplementary school affect the performance in language tasks in the majority (English) and heritage (Greek) language?

2. Method

2.1. Participants

The performance of 31 Greek-English bilingual children, 63–153 months old ($M = 105.39$, $SD = 27.03$), was tested. All children attended a Greek supplementary school and mainstream English school. Details of the group are presented in Table 1. Mean age of acquisition (AoA) for Greek was 8 months ($SD = 1.22$) and for English 1 year and 4 months ($SD = 1.76$). 10 children were simultaneous bilinguals and 21 were early sequential bilinguals. The children lived in England and were recruited if at least one of their parents spoke the Greek language with them. Eight children had one English speaking and one Greek-speaking parent and 23 children had only Greek-speaking parents. Three additional children were exposed to a third language, in addition to Greek and English and were excluded from the analysis. Children that were included in the analysis had to have similar educational experiences (mainstream English education and Greek supplementary school). As a result, five additional children were excluded because they had attended Greek mainstream school in Greece prior to arriving to the UK, namely three children for three years, one child for two years and one child for one year. Also, children’s scores were included in the analysis if their non-verbal intelligence score was within normal range (over 80; K-BIT-2; Kaufman and Kaufman 2004). In this case, all children had standardised scores over 80 ($M = 104.84$, $SD = 10.65$, Range = 85–124). Children’s language proficiency was reported by the parents for English ($M = 95.81$, $SD = 8.07$) and for Greek ($M = 74.52$, $SD = 21.58$). The SES was average and above average. Based on parental and teacher reports the children did not have any hearing, behavioural, emotional, or mental impairment which were exclusion criteria.

| Variable                              | Descriptive scores |
|---------------------------------------|--------------------|
| Age                                   | $31$               |
| $M$ (SD)                              | 104 (28.72)        |
| Range                                 | 63–153             |
| Sex                                   | 19f 12m            |
| Years in supplementary school         | $3.78$ (2.63)      |
| Range                                 | .25–9              |
| English proficiency                   | $95.81$ (8.07)     |
| Range                                 | 80–100             |
| Greek proficiency                     | $74.52$ (21.58)    |
| Range                                 | 20–100             |
| K-BIT-2                               | $104.84$ (10.65)   |
| Range                                 | 85–124             |
| Language use                          | $44.61$ (21.96)    |
| Range                                 | 0–76.79            |
| Total of mum and dad languages        | $4.35$ (1.33)      |
| Range                                 | 9–Mar              |
| SES                                   | $77.42$ (16.90)    |
| Range                                 | 37.5–100           |

Note: Age = participants’ age in months; f = female and m = male; English and Greek proficiency = percentage of proficiency from parental report; K-BIT-2 = non-verbal intelligence standardised score; Language Use = Percentage of language use with 0% being only English and 100% being only Greek; SES = the average percentage of mother and father education.
Bilingual Greek-English children were recruited from a Greek supplementary school in the northwest of England. The school offered a Greek-speaking supplementary program for 2.5–3.5 h a week to enhance the reading, listening, speaking, and writing skills in the Greek language and to offer knowledge around the Greek culture. This program is supplementary to the mainstream English education that these children attended.

Ethical approval was granted by the University's Research Ethics Committee. Information sheets were sent to the manager and head teacher at the supplementary school and to parents before the study and informed consent was sought. Teachers, parents, and children were provided enough time to express any questions about the nature of the study. Parents and children were informed that they could withdraw at any time and they were debriefed after the study.

2.2. Materials

2.2.1. Parental questionnaire

The children’s language experience was investigated through the Language and Social Background Questionnaire for Children (LSBQ; Luk and Bialystok 2013). The LSBQ was forward and backward translated in Greek and it was completed by the parents in their most convenient language (Greek or English). It consisted of information about the child’s age, grade, date of birth, country of birth, age of onset of all the languages, knowledge of playing a musical instrument, and length of exposure to different educational mediums. The questionnaire included information about the parents’ language backgrounds, namely the number of languages each parent speaks. The SES of the parents was measured as the mean of the highest attained educational level of both parents rated on an 8-point scale, which was then converted into percentages. Parental education is the most commonly used index of socioeconomic background, is highly predictive of other SES indicators (e.g. income, occupation), and is a better predictor of cognitive performance than other SES indicators (see Calvo and Bialystok 2014).

The child’s understanding and speaking in all of their languages was rated on a 5-point scale ranging from Poor to Excellent. The percentage of both scores for speaking and understanding in Greek was used as the Greek proficiency parental score used in the analysis. Similarly, the percentage of both scores for speaking and understanding in English was used as the English proficiency parental score used in the analysis. General language use throughout the child’s lifetime with parents, siblings, grandparents, neighbours, friends, and caregivers in various situations was measured on a 7-point scale ranging from 1 (only English) to 7 (only Greek/or other language). This was converted into a percentage, where 0% of language was only English and 100% was only Greek.

2.2.2. Non-verbal intelligence

Non-verbal intelligence was assessed using the Kaufman Brief Intelligence Test, Second Edition (K-BIT-2; Kaufman and Kaufman 2004). The test consists of 46 items including a series of abstract images, such as designs and symbols, and visual stimuli, such as pictures of people and objects. Participants are required to understand the relationships among the presented stimuli and complete visual analogies by indicating the relationship between the images by either pointing to the answer or saying its letter. All items include an option of at least five answers thus reducing chance guessing. The Matrices non-verbal subtest was individually administered, and standardised scores were calculated according to the K-BIT-2 manual for screening purposes.

2.2.3. Language measures

To assess the proficiency of the children in both their languages, receptive and expressive vocabulary measures in each language were administered along with receptive grammar assessments. Raw scores converted to percentages were used in the analysis.

2.2.3.1. English language measures. The British Picture Vocabulary Scale, Third Edition (BPVS3; Dunn and Dunn 2009) was used to assess the receptive vocabulary of the bilingual and monolingual
children in the English language. It is an individually administered, standardised test of Standard English receptive vocabulary for children ranging between 3–16 years and 11 months. In this task, children are asked to select, out of four coloured items in a 2 by 2 matrix, the picture that best corresponds to an English word read out by the researcher. The assessment consists of 14 sets of 12 words of increasing difficulty (e.g. ball, island, fictional). The administration is discontinued when a minimum of eight errors is produced in a single set.

The Clinical Evaluation of Language Fundamentals – Fourth UK Edition (CELF-4UK; Semel, Wiig, and Secord 2006) is an individually administered standardised measure used to assess the participants’ expressive vocabulary in the English Language in children and adolescents ranging from 5 to 16 years of age. Expressive vocabulary was screened through the Expressive Vocabulary for children. All initial raw scores were converted to percentages.

The Test for Reception of Grammar – Version 2 (TROG-2; Bishop 2003) was used to assess receptive grammar. It is an individually administered standardised test for children and adults and it comprises 80 items of increasing difficulty with four picture choices. Children are asked to select the item that corresponds to the target sentence read out by the researcher. For each grammatical element, there is a block of four target sentences. If not all four items of each block are established by the children, then the block is failed. The sentences include simple vocabulary of nouns, verbs, and adjectives. If a child fails five consecutive blocks the administration is terminated.

2.2.3.2. Greek language measures. A standard Modern Greek version of the Peabody Picture Vocabulary Task (PPVT; Dunn and Dunn 1981) was adapted and used based on the Greek adaptation by Simos et al. (2011). The test included listening to words, such as nouns, verbs, or adjectives, and one image out of four possible choices that best corresponded to the word heard. The words were of increasing difficulty and the children needed to click on the image out of the four that best matched to the word they heard. The children sat comfortably in front of the computer screen after their age and school grade was added to the test. This assessment lasted up to 10 min. If eight incorrect responses were provided to ten consecutive items, then the task was stopped thanking the child for their participation. Both Greek-English bilingual and Greek monolingual children were assessed to test their Greek receptive vocabulary.

The Picture Word Finding Test (PWFT; Vogindroukas, Protopapas, and Sideridis 2009) is an individually administered standardised measure used to assess standard Modern Greek expressive vocabulary. It is a tool norm-referenced for Greek. It is adapted from the English Word Finding Vocabulary Test – 4th Edition (Renfrew 1995). The children are presented with 50 black and white images consisting of nouns in developmental order. The words included originate from objects, categories of objects, television programs and fairy-tales very familiar to children. A score sheet is used to record the responses provided during testing and afterwards scored as correct (1) or incorrect (0). The children are asked to name the objects they saw and when they are ready, they move to the following one. The assessment is discontinued after five consecutive wrong replies.

The Developmental Verbal Intelligence Quotient (DVIQ; Stavrakaki and Tsimpli 2000) was used to assess Greek receptive grammar. It consists of five subtests used to measure children’s language abilities in expressive vocabulary, understanding metalinguistic concepts, comprehension and production of morphosyntax, and sentence repetition. This was an assessment that measured language development in standard Modern Greek, and it was administered individually. For this study, only the subtest measuring comprehension of morphosyntax was used. Each child was given a booklet with 31 pages, each including 3 images. The researcher read out a sentence and each child was asked to show the picture that best represented the situation in the sentence. For example, the sentence might have been μην καπνίζετε (do not smoke) and the correct answer depicted a ‘No Smoking’ sign. An answer sheet was used to record the child’s answers (as A, B, or C) during testing and afterwards scored as correct (1) or incorrect (0).
2.3. Procedure

The children were tested individually in a quiet school classroom setting, during one session in Greek and one session in English. Each lasted 40 min on average. The second session was conducted within one months’ time after the first one. Parents were administered the questionnaire (LSBQ) and returned it to the researcher, or the classroom teacher, or the school head teacher.

2.3.1. Greek session

The first session was the Greek session for the participants. Each child completed the tasks in the following order: (i) Greek adapted PPVT, (ii) Picture Word Finding Test, (iii) DVIQ. A pilot study with four children was conducted before the actual data collection.

After the end of the session, the researcher thanked the child for their participation. All tasks were administered as games and stickers and candy/chocolate were provided to the children after the end of the session. All children participated enthusiastically.

2.3.2. English session

The second session was the English session for the participants. Each child completed the tasks in the following order: (i) K-BIT-2, (ii) BPVS3, (iii) CELF-4, and (iv) TROG-2. The choice of the above order of tests was such so the children did not feel tired or uninterested.

After the end of the session, the researcher thanked the child for their participation. All tasks were administered as games and stickers and candy/chocolate were offered to the children after the end of the session. All children participated enthusiastically.

3. Results

3.1. Test performance

The performance of the children in the receptive and expressive vocabulary tasks and the receptive grammar tasks is presented in Table 2.

3.2. Multiple regression analysis

A multiple regression was run using the following variables: age in months, the total number of parental languages, SES, language use, English proficiency (parental report), and years in supplementary school. Greek proficiency based on the parental report was highly correlated with language use, so language use was only used in the model.

Table 2. Descriptive Statistics – Performance in tests (out of 100 scale).

| Variable       | Score          |
|----------------|----------------|
| PWFT           | M (SD) 36.06 (22.96) |
| Range          | 0–82           |
| Adapted PPVT   | M (SD) 35.67 (18.76) |
| Range          | 10.98–75.14    |
| CELF-4         | M (SD) 57.89 (24.24) |
| Range          | 9.26–100       |
| BPVS3          | M (SD) 64.52 (16.47) |
| Range          | 34.52–89.88    |
| DVIQ           | M (SD) 78.56 (15.12) |
| Range          | 38.71–96.77    |
| TROG-2         | M (SD) 71.51 (18.67) |
| Range          | 20–95          |

Note: PWFT = Greek expressive vocabulary score; Adapted PPVT = Greek receptive vocabulary score; CELF-4 = English expressive vocabulary score; BPVS3 = English receptive vocabulary score; DVIQ = Greek receptive grammar score; TROG-2 = English receptive grammar score. All scores are out of 100%.
The risk of multi-collinearity was checked by calculating the collinearity statistics of variance inflation factor (VIF) and tolerance (see Table 3). VIF and tolerance values did not indicate any multi-collinearity concern (VIF < 10 and tolerance > .10 for all variables) (Hair et al. 1998; Tabachnick and Fidell 2001). All the VIFs of the model’s predictors ranged from 1.390 to 5.439, therefore the effect of multi-collinearity fell within acceptable limits. Tolerance was above .184 in all cases.

3.2.1. Greek tasks
A multiple regression was run to predict Greek receptive grammar skill (DVIQ; see Table 4). Language use added significantly to the prediction, $p = .001$ and significantly predicted the Greek receptive grammar score in the DVIQ, $F(6, 24) = 3.36, p = .030, R^2 = .456$ (Adjusted $R^2 = .321$).

A second multiple regression was run to predict Greek receptive vocabulary skill (adapted PPVT; see Table 5). Language use statistically significantly predicted the Greek receptive vocabulary score in the PPVT, $F(6, 24) = 6.55, p < .001, R^2 = .621$ (Adjusted $R^2 = .526$).

A third multiple regression was run to predict Greek expressive vocabulary skill (PWFT; see Table 6). Language use significantly predicted the Greek expressive vocabulary score in the PWFT, $F(6, 24) = 4.96, p = .002, R^2 = .554$ (Adjusted $R^2 = .442$).

3.2.2. English tasks
A multiple regression was run to predict English receptive grammar skill (TROG-2; see Table 7). Age in months added statistically significantly to the prediction, $p < .001$. This variable statistically significantly predicted English receptive grammar skill in TROG, $F(6, 24) = 14.12, p < .001, R^2 = .779$ (Adjusted $R^2 = .724$).

### Table 3. Collinearity Statistics.

| Independent Variables          | Tolerance | VIF  |
|-------------------------------|-----------|------|
| SES                           | 0.535     | 1.868|
| Years in supplementary school | 0.184     | 5.439|
| English proficiency           | 0.778     | 1.286|
| Language use                  | 0.647     | 1.545|
| Mum & dad languages total     | 0.720     | 1.390|
| Age in months                 | 0.190     | 5.268|

Note: English proficiency = percentage of English proficiency from parental report; Language Use = Percentage of language use with 0% being only English and 100% being only Greek; SES = the average percentage of mother and father education.

### Table 4. Regression for DVIQ.

| Model                                | $B$  | SE$_B$ | $t$   | $p$   |
|--------------------------------------|------|--------|-------|-------|
| Age in months                        | 0.15 | 0.18   | 0.83  | .418  |
| Total number of parental languages   | −1.77| 2.02   | −0.88 | .388  |
| SES                                  | −0.35| 0.18   | −1.89 | .071  |
| Language use                         | 0.50 | 0.13   | 3.84  | .001  |
| English proficiency                  | −0.18| 0.32   | −0.55 | .589  |
| Years in supplementary school        | 1.36 | 2.02   | 0.67  | .506  |
| Constant                             | 87.15| 35.25  | 2.47  | .021  |

### Table 5. Regression for adapted PPVT.

| Model                                | $B$  | SE$_B$ | $t$   | $p$   |
|--------------------------------------|------|--------|-------|-------|
| Age in months                        | 0.16 | 0.19   | 0.85  | .404  |
| Total number of parental languages   | −0.53| 2.09   | −0.25 | .802  |
| SES                                  | 0.04 | 0.19   | 0.22  | .829  |
| Language use                         | 0.57 | 0.13   | 4.23  | .000  |
| English proficiency                  | −0.08| 0.33   | −0.24 | .811  |
| Years in supplementary school        | 3.09 | 2.09   | 1.48  | .153  |
| Constant                             | −11.11| 36.52 | −0.30 | .764  |
A second multiple regression was run to predict English receptive vocabulary skill (BPVS3; see Table 8). Age in months added statistically significantly to the prediction, \( p < .001 \). This variable statistically significantly predicted English receptive vocabulary skill in BPVS3, \( F(6, 24) = 31.89, p < .001, R^2 = .889 \) (Adjusted \( R^2 = .861 \)).

A third multiple regression was run to predict English expressive vocabulary skill (CELF-4; see Table 9). Age in months added statistically significantly to the prediction, \( p = .032 \). This variable statistically significantly predicted English expressive vocabulary skill in CELF-4, \( F(6, 24) = 3.66, p = .010, R^2 = .478 \) (Adjusted \( R^2 = .347 \)).

### 4. Discussion

The overall aim of this study was to explore language in a group of Greek-English bilingual children attending a supplementary school in England together with English mainstream school. More

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**Table 6. Regression for PWFT.**

| Model                        | \( B \)  | SE \( B \)  | \( t \)  | \( p \)  |
|------------------------------|----------|--------------|----------|----------|
| Age in months                | 0.05     | 0.25         | 0.21     | .835     |
| Total number of parental languages | 2.76     | 2.77         | 1.00     | .329     |
| SES                          | -0.09    | 0.25         | -0.36    | .721     |
| Language use                 | 0.75     | 0.18         | 4.25     | .000     |
| English proficiency          | 0.17     | 0.44         | 0.39     | .700     |
| Years in supplementary school| 3.24     | 2.78         | 1.17     | .254     |
| Constant                     | -36.65   | 48.49        | -0.76    | .457     |

**Table 7. Regression for TROG-2.**

| Model                        | \( B \)  | SE \( B \)  | \( t \)  | \( p \)  |
|------------------------------|----------|--------------|----------|----------|
| Age in months                | 0.75     | 0.14         | 5.26     | .000     |
| Total number of parental languages | 1.59     | 1.59         | 1.00     | .327     |
| SES                          | 0.22     | 0.15         | 1.54     | .136     |
| Language use                 | -0.05    | 0.10         | -0.45    | .659     |
| English proficiency          | 0.30     | 0.25         | 1.18     | .249     |
| Years in supplementary school| -3.13    | 1.59         | -1.97    | .060     |
| Constant                     | -45.62   | 27.74        | -1.65    | .113     |

**Table 8. Regression for BPVS3.**

| Model                        | \( B \)  | SE \( B \)  | \( t \)  | \( p \)  |
|------------------------------|----------|--------------|----------|----------|
| Age in months                | 0.52     | 0.09         | 5.83     | .000     |
| Total number of parental languages | 1.75     | 0.99         | 1.74     | .095     |
| SES                          | -0.03    | 0.09         | -0.38    | .710     |
| Language use                 | -0.04    | 0.06         | -0.68    | .501     |
| English proficiency          | 0.24     | 0.16         | 1.52     | .142     |
| Years in supplementary school| -0.17    | 1.00         | -0.17    | .865     |
| Constant                     | -13.06   | 17.38        | -0.87    | .395     |

**Table 9. Regression for CELF-4.**

| Model                        | \( B \)  | SE \( B \)  | \( t \)  | \( p \)  |
|------------------------------|----------|--------------|----------|----------|
| Age in months                | 0.65     | 0.29         | 2.28     | .032     |
| Total number of parental languages | -1.62    | 3.17         | -0.51    | .614     |
| SES                          | 0.05     | 0.29         | 0.18     | .861     |
| Language use                 | 0.19     | 0.20         | 0.96     | .348     |
| English proficiency          | 0.61     | 0.50         | 1.21     | .237     |
| Years in supplementary school| -1.49    | 3.17         | -0.47    | .643     |
| Constant                     | -68.19   | 55.38        | -1.23    | .230     |
specifically, we aimed to explore what variables predict performance in Greek and English language tasks and if the length of attending a supplementary school affects the performance in language tasks in the majority (English) and heritage (Greek) language. In order to pursue this, we assessed the children’s receptive and expressive vocabulary as well as their receptive grammar in both languages, in order to investigate which variables such as years in supplementary school, general language use throughout the lifetime, SES, the total number of languages spoken by the parents and parental report of proficiency affect these scores. This is the only study to date that investigates this relationship between exposure to a supplementary school setting and scores in both languages.

Our first aim was to investigate the variables that can predict these vocabulary and grammar scores. We performed a multiple regression analysis for each task. Language use significantly affected the scores in all Greek language tasks, namely the higher the use of Greek, the higher the scores in the Greek vocabulary and grammar tasks. This is in line with Papastefanou, Powell, and Marinis (2019) who found that Greek expressive vocabulary was related to the Greek language used in and out of the home. Papastefanou, Powell, and Marinis (2019), who tested 40 Greek-English bilingual children in Year 1 and Year 3, found that language use and expressive vocabulary test scores were strongly correlated in the heritage language, Greek, which highlights the importance of parental language use in the heritage language.

On the other hand, language use did not significantly predict scores in the English vocabulary and grammar tasks. Age was a significant predictor in the model, which was expected since these are standardised tasks and children perform better as they grow older. Similarly, Duursma et al. (2007) found parental use of English in the home was not a predictor for English language proficiency of 96 Year 5 Latino English language learners.

The fact that higher scores in Greek language tasks were dependent on the use of Greek highlights that parents wishing to maintain Greek should use Greek in and out of the home. Importantly, the fact that English scores were not affected by Greek language use may help allay fears that heritage language could affect the development of mainstream language negatively. This is in line with studies failing to find evidence that maintaining a home language endangers the acquisition of the majority language (Poarch and Bialystok 2017).

Our second aim was to investigate if the length of attending a supplementary school affects the performance in language tasks in the majority (English) and heritage (Greek) language. We found no significant negative relationship between attending a supplementary school and the development of English vocabulary and grammar skills. One might expect that years in supplementary school would be a positive predictor for the scores in Greek vocabulary and grammar tasks, however, this was not found. One interpretation could be that the tests used are designed for monolingual Greek speakers and not bilingual ones and may not accurately reflect the proficiency of the bilingual children in each language. Secondly, it might be an issue of the amount of input. Children attended supplementary school 2.5–3.5 h per week where they were taught via the Greek medium. This possibly is sufficient to maintain these skills but not develop them.

5. Implications, future directions and limitations

Since some Greek-English pupils in the UK sit GCSEs or A Levels in the Greek and English language, this study has further implications in regard to academic achievement. During the last few years, this rise in first-generation Greek nationals and their children who have moved to the UK with their parents due to the 2010 government-debt crisis (also see Karatsareas 2020) has changed the Greek population attending these supplementary schools, calling for future changes in the curriculum followed in these schools. More research is needed into the amount and nature of educational input needed to develop children’s academic skills.

Further support and encouragement could be provided to parents in using the heritage language with their children based on the fact that no significant negative relationship was found between
attending a Greek supplementary school or using more Greek (heritage language) in the home, and the development of English vocabulary and grammar skills.

We used non-standardised tasks to assess Greek receptive vocabulary and grammar skills in the children as well as English tests which are not standardised for bilingual children. As a result, tests in Greek and English were not comparable. Future development of tests is needed in Greek and English which should also include bi-mutilingual children (Babatsouli 2019; Marinis, Armon-Lotem, and Pontikas 2017). Also, standardised Greek tests assessing language skills are lacking or are outdated, and a large study would allow test standardisation and the establishment of quantitative norms.

The finding that years in supplementary school was not a predictor for the scores in Greek vocabulary and grammar tasks could be further investigated by comparing scores from Greek-English bilingual children who attend Greek supplementary schools with Greek-English bilingual children who attend a Greek-English bilingual school and with those who do not. This was not possible in this study but is an important future direction to further understand this result.

Finally, the relatively small sample size of this study is one of its limitations. Nevertheless, this is the only study to date that investigates this relationship between exposure to a supplementary school setting and scores in both languages.

Our findings, together with previous research on heritage/Greek language education abroad on this emergence of a new emigration wave (e.g. Aravossitas and Sugiman 2019; Baros, Sailer, and Moutsis 2019; Karatsareas 2021a, 2021b; Voskou 2021), highlight the need for further investigation of this understudied and constantly changing Greek-speaking population. This significant rise in the emigration of couples and families from Greece after the 2010 crisis (Pratsinakis 2019) underlines how important it is to explore what the opportunities and challenges are that ‘new’ Greek migrants create to Greek language education abroad. This cannot be done without identifying the language skills of these children and how they develop. Due to this increase of Greek migration not only to the UK but around the world, as Lytra (2019, 238) stresses, ‘Greek schools, their leaders and teachers are called upon to adapt and change in response to the increased heterogeneity and complexity of children and their families’ multilingual repertoires, educational experiences, expectations and aspirations.’ Cushing, Georgiou, and Karatsareas (2021) and Pantazi (2010) call for modified teaching approaches and practices, acknowledging student needs and identities, and closer links between community and mainstream educational settings.

6. Conclusion

In the current study, we aimed to explore the role of supplementary educational setting on the Greek and English language skills of Greek-English bilingual children and which variables predict performance in Greek and English language tasks. While there are many qualitative studies exploring supplementary schools, to the best of our knowledge, no other study has explored if and how the length of attending a supplementary school affects the performance in language tasks in the majority (English) and heritage (Greek) language. In order to pursue this, we assessed the children’s receptive and expressive vocabulary as well as their receptive grammar in both languages, and via a questionnaire parents provided information about their children’s years in supplementary school, children’s general language use throughout the lifetime, their SES, their total number of spoken languages and their children’s proficiency scores.

Findings suggest that more use of Greek is a significant predictor of higher scores in Greek tasks while at the same time it is not a negative significant predictor of scores in English tasks. At the same time, we did not find a significant negative relationship between attending a supplementary school and the development of English vocabulary and grammar skills. These findings provide support for parents/wider family to use Greek in and out of the home. Parents might be hesitant in using the heritage language in and out of the home so as not to disadvantage their child, however, the current study suggests that the use of Greek does not negatively affect English scores, while it enhances Greek language scores.
Finally, years in supplementary school did not significantly predict scores in Greek vocabulary and grammar tasks. Future intervention studies can further investigate the curriculum used and amount of exposure/time that these children attend Greek supplementary schools in order to enhance their vocabulary and grammar in Greek.

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Data availability statement

The datasets generated for this study are available on request to the corresponding author.

Disclosure statement

We have no known conflict of interest to disclose.

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