University of Southampton

Faculty of Arts and Humanities

Department of Languages, Cultures and Linguistics

Investigating the Linguistic and Social Effects of the First Year of Schooling on the Grammar of Child Heritage Speakers: Focus on Polish Heritage Children in the UK

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by

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Abstract

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This thesis investigates how changes in input and exposure to the majority language affect heritage language acquisition in the first year of school (known as Reception in the UK school system). Starting school is a crucial event in the life of a child heritage speaker: it signals the exposure to the majority language and a significant change in their linguistic input; it also signals a change in their social environment. This group of speakers experiences a major shift in their linguistic input and social context around the age of 4: they start school in the majority language. In this study, I focus on the acquisition of case by a group of 30 Polish child heritage speakers in England in order to try to tease apart three possible accounts: incomplete acquisition (Montrul, 2008; Polinsky, 2006; Silva-Corvalán, 2003), attrition (Polinsky, 2011) and parental input effects (Pascual y Cabo, 2018; Montrul & Sanchez-Walker, 2013; Pires & Rothman, 2009). The specific research questions addressed in this thesis examine the extent of evidence of incomplete acquisition of case among these child heritage speakers and whether attrition occurs in the first year of Reception. The thesis also examines whether any increase or decrease in accuracy over the first year of Reception can be explained by language input and social networks.

In order to address these questions a narrative retelling task and an acceptability judgement task were used to assess the productive command and grammatical knowledge of three cases (nominative, genitive and locative). Sociograms were used to investigate the heritage children's social networks. 130 participants took part in this study: 30 Polish heritage children and 30 Polish heritage parents in the UK and control groups which included: 30 Polish monolingual children in Poland, 20 monolingual Polish adults in Poland and 20 English monolingual children in the UK. The heritage speakers were tested twice, at the start and at the end of their first year in primary school. Some participants were also tested at the end of their second year at school. The BiLEC questionnaire (Unsworth, 2013) was used to assess the importance of any variables relating to language experience. Accuracy rates were analysed using mixed effects logistic regression models in R.

The results show that at group level, Polish heritage children do not differ from Polish monolingual children. Descriptively, however, it is clear that individually some of the Polish heritage children diverge from the baseline compared with the monolingual children in Poland. Furthermore, a heritage-only analysis in both tasks shows that for one of the cases, i.e. locative, Time (from start to end of Reception) has an effect. The decrease in accuracy is statistically significant for heritage speakers as a group and input quality (richness of exposure – RoE) is the predominant explanatory factor for this result by Polish heritage children. In the light of the original hypotheses, among some of the heritage children problems with case are visible from the start of the year, pointing to ongoing acquisition but only in a subgroup of children due to language-internal factors such as structural complexity associated with timing of acquisition, and in some children only at the end of the year, indicating onset of attrition in providing the exponent of one functional category. The individual analysis also reveals the influence of RoE and social networks on heritage language maintenance. Findings from this study confirm that some key changes do occur after the first year at school, but this change is only attested in some grammatical cases and for some children and it is modulated by both linguistic and social factors.

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Research Thesis: Declaration of Authorship

Print name: ANNA HART

Title of thesis: Investigating the Linguistic and Social Effects of the First Year of Schooling on the Grammar of Child Heritage Speakers: Focus on Polish Heritage Children in the UK

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signature: Date: 06/06/2025

Thesis Dedication

I dedicate this thesis to…my boys

"Believe in yourself and believe in your dreams. Follow them, never give up, that's the most important thing. If you believe you can get there, then one day you will."

J. Moutinho

Acknowledgements

They say a journey of a thousand miles begins with a single step. Many years ago, on a beautiful summer's day when I was just 10, my mum bought me a book: *English for Beginners*. Do not ask me why but on the very same day, I decided to learn this language: I took a pen, wrote Lesson 1 and with that single step, fast forward a thousand miles in time and distance, and here I am writing these acknowledgements to my PhD thesis – the culmination of a journey which I could scarcely have believed would happen, all those years ago. But I believe that for any journey to be successful, we need to be equipped with the right tools and for that I want to thank, in the first place, my mum - for providing me with such tools and for opening the world to me even though it meant I would end up living a thousand miles away from her, literally. Apart from the right tools, every journey needs the right mindset and attitude. For this, I thank my dad who is the most hard-working and tenacious person I know; he (unknowingly) taught me to never give up on any challenge, no matter how large or small, and that has proved absolutely priceless during this process. But the skills mean nothing on their own if you do not have someone who believes in you from the start – I would like to thank my husband for convincing me well ahead of beginning this journey that I CAN do this, and for encouraging me all the way – as well as saving the day so many times with many hugs and much-needed cups of tea; Simon – I could not have done it without you! I would also like to thank my two ace boys for their patience as they have seen me a little less (relaxed!) during the last few years, but I want them to know that there are still many great journeys and adventures together ahead for us.

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Definitions and Abbreviations

ACC ..... Accusative

AJT ..... Acceptability Judgement Task

BiLEC..... Bilingual Language Experience Questionnaire

CLI..... Cross-Linguistic Influence

CPH..... Critical Period Hypothesis

DOM ..... Differential Object Marking

DP ..... Determiner Phrase

F ..... Feminine

GEN ..... Genitive

GEN POSS..... Genitive possessive

HL..... Heritage Language

HLA ..... Heritage Language Acquisition

ID ..... Individual Differences

INS ..... Instrumental

L1 ..... First language

L2 ..... Second language

LOC ..... Locative

M ..... Masculine

NOM ..... Nominative

PL ..... Plural

POSS ..... Possessive

PREP..... Preposition

PRS..... Person

RoE..... Richness of Exposure

SG ..... Singular

UG..... Universal Grammar

WPM..... Words Per Minute

Chapter 1 Introduction

1.1 Purpose of the dissertation

In this thesis, I investigate how changes in input and exposure to the majority language affect heritage language acquisition in the first year of school. In the life of a child heritage speaker, starting school is a crucial event: it marks a regular exposure to the majority language (some children might have been introduced to it in pre-school though this could be less consistent and vary from a child to a child). It also marks a significant change in their linguistic input – in this new linguistic community, parents are not the main source of linguistic information to their children. Starting school also signifies a transformation in their social environment.

The most prominent accounts in Heritage Language Acquisition (HLA) which have been proposed to explain heritage speaker acquisition are: incomplete acquisition (Montrul, 2008; Polinsky, 2006; Silva-Corvalán, 2003), attrition (Polinsky, 2011) and parental input effects (Pascual y Cabo, 2018; Montrul & Sanchez-Walker, 2013; Pires & Rothman, 2009). The first two accounts are not mutually exclusive and in order to tease them apart a longitudinal study is required; input effects, in the sense of reduced input, may lead to attrition or to incomplete acquisition – or neither of both. It is possible that heritage children are affected by changes in the input they receive from their parents (parental input effects, which I will explain in greater depth in section 2.4). It is also conceivable that heritage children over time are losing grammatical structures they have previously acquired (attrition, see section 2.5) or alternatively, that they have not had an opportunity to acquire some aspects of their heritage language in the first place (incomplete acquisition, see section 2.3). There is also a possibility that heritage children acquire their HL like monolingually-raised children (Kupisch *et al*., 2016; Flores *et al*., 2017; Flores & Barbosa, 2014). For well over a decade now, researchers in the field of HLA have focussed on school-age heritage children analysing the effects of input and schooling, applying an approach that examines sources of individual differences (ID) among these speakers including factors that account for individual variation in bilingual development that can be internal or external to a child heritage speaker (e.g. Rodina *et al*., 2020; Kupisch *et al*., 2021; Torregrossa, Flores & Rinke, 2023; Chondrogianni & Daskalaki, 2023; Sopata, Rinke & Flores, 2024; including studies on Polish child heritage speakers, e.g. Sopata, 2019; Rinke, Sopata & Flores, 2019; Sopata *et al*. 2021; Sopata & Długosz, 2021). Recent approaches to HL challenge deficit-oriented perspectives highlighting the robustness of bilingual language acquisition, which is characterized by individual variation and input variability, and may not reflect interrupted development. Adding more research on school-age heritage children from different

communities and language combinations could turn out to be useful for analysing the influence of any relevant factors in their HL development, and for moving away from a deficit-oriented framework to a bilingual difference framework focussed on specific contexts as well as facilitate our understanding of how these effects occurred. With Polish being currently the second most spoken language in the UK (White, 2017), Polish citizens are the largest ethnic minority in this country. Polish heritage language speakers are an important and a representative population in the UK that so far received hardly any attention in heritage speaker studies. In this study, I focus on the acquisition of case by a group of 30 Polish child heritage speakers in England in order to try to test the three possible accounts outlined at the beginning of this section.

Taking into consideration the importance of the sociolinguistic context (Milroy & Milroy, 1980; Kerswill & Williams, 2000; Cheshire *et al.,* 2008) for the Polish heritage children and the documented influence of social factors for child heritage speakers (e.g. Rodina *et al*., 2020; Chondrogianni & Daskalaki, 2023; Torregrossa, Flores & Rinke; Correia, Lobo & Flores, 2024; Kubota & Rothman, 2025), I examine whether any potential changes observed over the course of the first year of school are related to the social aspects of this first year, particularly who they are speaking to, i.e. by their social networks (their friends). This thesis aims to contribute to a deeper understanding of this sociolinguistic context and how they can potentially interact with linguistic variables and enrich our understanding of Heritage Language Acquisition (HLA). What is more, the longitudinal character of this study allows to investigate the dynamic nature of these factors over an extended period of time revealing patterns that might otherwise be missed out as these type of studies are scarce. The key difference between the current study compared to other studies carried out to date is that it investigates whether the heritage children's systems are complete or not before they enter the mainstream education in the majority language and whether they change as a result of crucial changes in their linguistic environment and social networks.

The following section introduces the theoretical background of the current study.

1.2 Theoretical background

The theoretical framework adopted in this thesis is that of generative grammar and its most current Minimalist Program (e.g. Chomsky, 1995, 1998, 2000). The principal concept of the generative framework (Chomsky, 1965) assumed that the capacity for language and language acquisition is a human genetic endowment and that humans have access to an innate faculty of language with Universal Grammar as its integral part. In other words, a child is born with abstract grammatical knowledge such as nouns, verbs, determiners, tense, agreement etc. as

well as the computational principles for combinations of these elements and that grammatical knowledge is triggered by exposure to input (Montrul, 2016).

In line with the Minimalist Program (1995), the two main components of the faculty of language are: a computational system and a lexicon consisting of lexical items that are formed by bundles of phonological, semantic and functional features. This means that grammatical knowledge of a language or variety consists of a particular set of features that Universal Grammar makes available during language acquisition. These prove invaluable for linguistic analysis and case is one of such "features into which linguistic units, such as words can be broken down" (Kibort, 2008:1). Hence, in this thesis I am going to focus on three grammatical cases bearing in mind that "no feature in any language has values which are consistently realised in the permitted ways across all relevant elements" (Kibort, 2008: 1).

Therefore, with the Minimalist framework adopted, language acquisition is evaluated as the acquisition of features (Travis, 2008). Following Chomsky (2000, 2001, 2004), in first language acquisition, when children are exposed to linguistic input a process of selection of a subset of features takes place that are assembled onto lexical items. Each language selects and assembles these features onto functional categories and lexical items differently. In other words, "to acquire a particular language means to acquire (or select from a universal inventory) its basic elements, that is, the set of sounds that when combined in a particular way define the phonology of the language and a set of words that feed the computational system that generates phrases and sentences that conform to the possible phonological, morphological, syntactic, semantic and pragmatic "rules" of the language" (Montrul, 2016: 100). This exposure to linguistic input that young children receive brings into focus the poverty of stimulus (coined by Chomsky, 1980), which is an argument for the existence of UG and in other words it assumes that children can acquire an adult grammar despite scarce evidence in the input. The amount of input required can sometimes be very minimal for successful acquisition of some features of the grammar.

In the case of bilingual acquisition, a bilingual child who is exposed to two languages as input, is faced with a task to determine what is grammatical in each language. When children learn two languages they follow the developmental sequence established in each of the languages (Meisel, 1990, 1994). Similarly to first language acquisition, substantial exposure to a language in the environment as well as its use in a variety of social contexts play a crucial role in bilingual language development. What is more, there are additional challenges in a bilingual environment since any linguistic milestones have to be accomplished in two languages when input in each language is not 100%, but a proportion thereof (i.e. 30-70%, 50-50%, etc.) (Montrul, 2016). Following Paradis (2023: 794) "bilingual children are learning two languages and so their

linguistic input space is divided and can change daily or weekly with respect to the quantity and quality of input and interaction in each language". Age of onset of L2 acquisition (AoA) is also a key factor in bilingual language acquisition and HLA differentiates between simultaneous and sequential bilinguals. Simultaneous bilinguals grow up acquiring two languages from birth (hence, their AoA is the same for each language) and sequential bilinguals acquire their languages in a sequential manner (meaning they experience a later AoA of L2, therefore they are exclusively exposed to the HL in the first years of life). There are studies showing that this has an effect, e.g. for vocabulary (Armon-Lotem, 2021) or morphosyntax (Soto-Corominas *et al.*, 2021) though some researchers point to AoA having no effects on HL outcomes (Makrodimitris & Schulz, 2021; Torregrossa *et al.*, 2023). As Torregrossa *et al*. (2023) point out, this advantage that sequential bilinguals have may be limited to early (initial) stages of acquisition. With regards to the simultaneous bilinguals, it is possible to acquire the two languages at the same time (De Houwer, 1990), however this does not necessarily mean they can be acquired to the same (monolingual) standard. Slabakova (2016: 93) explains that there is "robust evidence showing that the two languages of a bilingual are constantly activated" (e.g. Kroll & Bialystok, 2013) and "that it is hard to imagine that the two languages of a simultaneous bilingual do not interact and influence each other" (p. 133). This can sometimes lead to cross-linguistic influence for some properties (e.g. Meir & Janssen, 2021; Fridman *et al.,* 2023) where for example case acquisition in the heritage language (HL) is influenced by the properties of the majority language. The acquisition of morphology can sometimes be hindered when there are differences in the mapping of functional features (e.g. with Russian-Hebrew bilinguals where accusative and genitive are marked differently in these two languages) and/or the absence of this very feature marking (e.g. with Russian-Dutch bilinguals where accusative and genitive are marked in Russian but not in Dutch) (Meir & Janssen, 2021). As already mentioned in a situation where features are selected in both languages, but assembled in different ways, cross-linguistic influence may be a factor (Domínguez, Arche & Myles, 2011). This may lead to transfer where linguistic features from one language are integrated into another language and lead to restructuring. In a bilingual setting, two languages are constantly activated and the constant influence or transfer from a stronger language often maps itself onto the weaker one. In such a setting, where two languages are present we can expect both positive and negative influence of languages involved (e.g. Schwartz *et al.,* 2014). It is however worth remembering that this is just one of the outcomes of HLA and some studies claim the opposite (e.g. Rinke & Flores, 2018; Rodina *et al.*, 2020; Torregrossa *et al.*, 2021). Sequential bilinguals are also faced with similar challenges, however essentially they would not be exposed to two languages simultaneously, but instead exposure to their heritage language would come as first and continues when they go to majority language school or even pre-school (Montrul, 2016) when they start acquiring the majority language. Therefore, these two groups of bilinguals are exposed to two languages at

different chronological points, which as a result may lead to differences in their language abilities in their respective languages.

At this point, when talking about the chronology, it is worth mentioning one of the concepts that is crucial to what generative approach to acquisition entails. First of all, in the context of first language acquisition, Lenneberg (1967) put forward a Critical Period Hypothesis (CPH) stretching from age 2-12. According to the assumptions of the CPH, during this period key neurological changes occur in the brain that decrease its plasticity, resulting in difficulty learning languages after age 12. This hypothesis centres around the idea that we are biologically predisposed to acquiring language during this critical period of development or at least, that this is a sensitive period (which is a less of a deterministic term to the critical period (Birdsong, 1999)). What is important to remember is that not all of the properties of a language are acquired at the same time within this critical period and bear various maturational schedules, i.e. different rates of acquisition for different features. For example, Spanish children find subjunctive a challenging part of grammar that takes a more substantial period of time to be acquired (Montrul, 2008). It is crucial to consider these maturational schedules for studies of heritage children in general. In the context of heritage language acquisition this is particularly relevant as it means that early exposure to heritage language significantly enhances linguistic development, i.e. early onsets of bilingual first language acquisition (during childhood) show better linguistic skills than later ones (e.g. Chondrogianni & Schwartz, 2020; Torregrossa *et al.*, 2023), in line with the CPH.

In this study, I investigate a group of sequential child heritage speakers following a generative perspective in the analysis of the heritage language. Bearing in mind the assumptions of the Minimalist program, I examine how potential changes to HL input and exposure to the majority language affect heritage language acquisition in the first year of school when these child heritage speakers are negotiating a switch in their linguistic and sociolinguistic environment in a bilingual setting.

Having provided the conceptual background for this study, I present the organisation of this thesis.

1.3 Organisation of the thesis

This thesis is organised into seven chapters. Chapter 1 provides the purpose and rationale for the thesis as well as the theoretical background. In Chapter 2, I introduce the heritage speakers and I review the previous literature regarding different accounts used to explain their performance. In Chapter 3, I describe case marking in heritage speakers with a focus on Polish

case providing details on previous research and acquisition of case in Polish. In Chapter 4, I provide the sociolinguistic context regarding starting school and social networks. In Chapter 5, I include a detailed description regarding the design of the current experimental study. This chapter begins with the research questions which are followed by predictions and the methodology endorsed to answer the proposed research questions. In Chapter 6, I present the results of the experimental study which is followed by Chapter 7 in which I discuss the findings and how they address the research questions and contribute further to understanding heritage language acquisition. This chapter also includes the conclusion as well as contributions and limitations of the study.

Chapter 2 Heritage speakers and theoretical proposals

2.1 Introduction

In this chapter, I provide a general overview of heritage speakers as well as review theoretical proposals that attempted to explain their linguistic development as part of heritage language acquisition. The chapter is structured as follows: in Section 2.2, I introduce the definition of heritage speakers providing a background for the theoretical proposals which follow. In Section 2.3, I present an overview of the incomplete acquisition account which is followed by an evaluation of the parental input effects in Section 2.4. In Section 2.5, I evaluate the attrition account and its studies. In Section 2.6, I present research on HL development in school-age children and the effect of internal and external factors, and finally, in Section 2.7, I provide a summary of these theoretical proposals.

2.2 Definition of heritage speakers

As it is important to understand the speakers behind the theoretical proposals for heritage language acquisition, first I define heritage speakers and provide an overview of their main characteristics.

Heritage speakers are individuals who are raised in homes where a language other than the majority language is spoken (e.g. Polish children growing up in England or Swedish children growing up in France), which means that they are bilingual speakers to some degree in both the majority language and the heritage language spoken at home (Valdés, 2000; Polinsky & Kagan, 2007, Rothman & Pascual y Cabo, 2012; Benmamoun *et al.,* 2013, Montrul, 2016; Polinsky & Scontras, 2020). This is the narrow definition of a heritage speaker and this is how it is used in this thesis. The broad definition refers to heritage speakers who have a cultural connection with the heritage rather than any actual knowledge of their heritage language and as such it is not followed in this study. One of the most distinctive characteristic of heritage speakers is that they are early bilinguals, meaning they are acquiring more than one language from birth as opposed to late bilinguals who would access the L2 later in life (e.g. Montrul, 2016). With regards to the speech community, heritage speakers generally have less opportunities to access their heritage language as it is the majority language that would be used and spoken in the broader speech community (Montrul, 2016). Access to a heritage language depends on how extensive a given heritage community is in a given setting, and may impact on the knowledge of a heritage

language as speakers may have more or less opportunities to access the input and to interact with interlocutors in their minority language. This points to another common characteristic of heritage speakers: variation (Silva-Corvalán, 1994), not just in language proficiency levels as these can also vary at different points in time (Carreira & Kagan, 2011), but also in their language ability rendering them a significantly heterogeneous group of speakers. They would be hearing and speaking the heritage language and the majority language either simultaneously (and acquiring minority and majority language at the same time) or sequentially (being heritage language-dominant, because they began acquiring this language first) as they grew up (Benmamoun *et al.,* 2013). The type of bilingualism seems to play a role here as the simultaneous bilinguals appear to be less proficient in the heritage language than sequential bilinguals who develop and use that language differently (e.g. Polish-German pre-schoolers growing up in Germany, (DeHouwer, 2023)). Usually, the exposure to a heritage language would be more extensive in the early years before they experience a more intense, increased exposure to the majority language at the point of starting school though it has been proposed that this type of influence can be noticeable even in the pre-school years; for example, Kupisch *et al*., (2021) who compared 4-6-year-old Russian-German heritage speakers to 7-9-year-old Russian-German heritage speakers observed a shift towards the majority language and indicated that in German the older children sound less accented than the younger children, while the opposite is true for Russian. Aside from the age of exposure affecting the mastery of HL, Benmamoun *et al*. (2013) also stress the impact of social and cultural factors influencing the knowledge of HL such as heritage language status, prestige and restricted social contexts of use and frequency of use or the language that heritage speakers tend to use with their siblings. For example, it is very often the case that siblings speak in the majority language between themselves (Montrul, 2010), which means that the ability to produce heritage language will depend not only on the child heritage speaker's access to a broader community, but also upon their willingness to speak it with them. Aside from such varied family and language dynamics, the school context will also play a role in a life of a child heritage speaker.

Usually, with the onset of schooling in the majority language (the dominant language of the society) their heritage language (which denotes the minority language of that society) becomes weaker (Polinsky, 2018) as their input becomes relatively constrained and the majority language tends to become dominant during the school age period (e.g. Kupisch *et al.,* 2021) and children "have a strong desire to fit in with the new society" (Montrul, 2011: 157). The school context may be an example of a point in time when child heritage speakers are being subjected to internal or external pressures of wanting to fit in and using the heritage language with less frequency as it would be the case in the early childhood. Being surrounded by a dominant language and wanting to conform their speech to persons they like (Myers-Scotton, 2006), heritage speakers

use the dominant language more often. Kerswill (1996: 532) concludes that "when children realize that their home language is a minority language and it is not spoken beyond the home, they often switch to the majority language spoken by their social group". Additionally, the pressure to use the majority language may come from the heritage families themselves who feel they need "to assimilate to the mainstream culture" (Rothman, 2009: 157) and what is more, heritage children's education in heritage language is restricted unless they attend Saturday schools/heritage language schools frequently making them illiterate in heritage language and lacking exposure to written language (Polinsky, 2018). This often results in heritage speakers being unbalanced bilinguals (Polinsky & Scontras, 2020); however, they are still native speakers of their heritage language (Montrul, 2013; Rothman & Treffers-Daller, 2014) and their heritage languages are characterized by a coherent grammar (meaning it is consistent) (Polinsky & Scontras, 2020). Unlike the monolingual children, who grow up in a different sociolinguistic context, heritage children have "sophisticated language learning capacities, but the ability to understand and speak a language can go away, completely or partially, when optimal input conditions are not available beyond infancy" (Montrul, 2023: 400). When this input is limited or fluctuates, then some aspects of the heritage language grammar become affected in child heritage speakers (e.g. Correia & Flores, 2017). Below, I explain how their grammars are affected.

Polinsky and Scontras (2019: 50) explain the ways in which heritage speakers' grammars can be different and outline some defining characteristics of the HL system such as "high regularity of grammatical paradigms, commitment to fully-compositional expressions, low tolerance of ambiguities at various levels of linguistic representation, preference for perceptually-salient forms over the ones that are perceptually weak, and related difficulty with silent (missing) material in linguistic forms." Another characteristic is also simplification (e.g. Silva-Corvalán, 1994; Albirini, 2011) and structural changes (e.g. case marking subject to replacement or omission). Areas such as morphology, phonology, lexicon and syntax seem to be affected in heritage grammars though phonology would be the least affected area with researchers confirming that some of the heritage speakers sound more nativelike than for example second language learners (e.g. Chang *et al.*, 2008). The remaining areas appear to be more problematic to this group of speakers. For example, with regards to nominal morphology case marking in highly inflected languages such as Polish (e.g. Laskowski, 2009) or Hungarian (e.g. Bolonyai, 2007). In the first study, where Swedish is the majority language, Polish heritage children replace some of the more complex, later acquired over maturational schedule cases with nominative or other cases whilst in the Hungarian study where English is the majority language, heritage children omit inflections in possessive be-clauses and the main source of vulnerability is reported to be the syntax-semantics interface where the weaker L1 is most susceptible to L2

influence (Bolonyai, 2007). Syntax is another area where heritage speakers have difficulties and an example of this is Polinsky's (2011) study on relative clauses in which Russian child heritage speakers with English as majority language had no problems with the Russian syntax, but the adult heritage speakers reanalysed it into a new system where they allowed just for subjects as opposed to objects to act as heads of relative clauses. Lexical knowledge also seems to appear weaker in heritage speakers than in the baseline in general for heritage speakers.

Naturally, researchers have focused on trying to explain why heritage language speakers are different from other native speakers. As mentioned in the introduction, the literature on Heritage Language Acquisition highlights the following possible factors (Montrul & Polinsky, 2021; Polinsky, 2018; Domínguez *et al.*, 2019) that help shape heritage grammars: incomplete acquisition (e.g. Montrul, 2008; Polinsky, 2006, 2008; Silva-Corvalán, 2003); attrition (e.g. Polinsky, 2011) and parental input effects (e.g. Pires & Rothman, 2009). More recently however, latest approaches to HL challenge the deficit-oriented ones and researchers have been applying an approach that examines sources of individual differences including internal and external factors.

In the following sections, I introduce each of these theoretical proposals.

2.3 Incomplete Acquisition

The incomplete[1] acquisition account proposes that by comparing grammars of heritage speakers to the language of monolingual speakers, we are able to pinpoint which grammatical elements are incompletely acquired if we look at the features that are either missing in heritage speakers' grammars or that are used in a different manner by heritage speakers. According to the definition within this theoretical proposal, the acquisition of certain language elements has not yet been completed and is not at the same level found amongst monolingual grammars – either because of age of acquisition or lack of opportunity (Domínguez, 2009). Incomplete acquisition means that "aspects of the heritage grammar do not have the chance to be acquired due to insufficient L1 input exposure" (Domínguez *et al.*, 2019: 247). Insufficient input means that child heritage speakers encounter input that varies in terms of quantity and quality in their family and social environment as it is internally variable. As an example Silva-Corvalán (2014) demonstrated in her longitudinal study that the input that the two siblings below the age of three

[1] Although this term has been deemed by some researchers as judgemental about heritage speakers themselves (e.g. Pascual y Cabo & Rothman, 2012; Putnam & Sanchez, 2013; Kupisch & Rothman, 2018; Polinsky 2018), it is, as Domínguez, Hicks & Slabakova (2019) argue, still a more suitable term to describe the grammatical outcomes in heritage speakers, nor it is meant in any way as to detract from the heritage speakers' ability to acquire the elements of grammar or to be stigmatizing of heritage speakers and it does not implore they are in any way deficient as persons.

received was enough for acquisition of some structures; on the other hand the same amount of input was not enough after they turned three for some of the other, possibly more complex structures. Similarly, Albirini and Benmamoun (2014) in their comparative study of acquisition of plural morphology in Arabic in L1, L2 and heritage speakers concluded that the difficulties that heritage speakers displayed were mainly restricted to forms that are acquired late by L1 children.

Benmamoun *et al*., (2013: 36) explain that "it is possible that around school age, when many children start attending monolingual schools in the majority language, certain linguistic properties are not yet part of their internalized knowledge, even though performance of these properties may be witnessed in their speech". The incomplete acquisition account has been used as one of the main explanations for why we find these gaps in the grammatical knowledge of heritage languages and is often characterized by grammatical reductions, simplifications, and reanalyses (Domínguez *et al*., 2019). As an example, Silva-Corvalán (2003) compared the results of the bilingual adults from an earlier study by Silva-Corvalán (1991, 1994) with those of pre-school children aged 5; 1 to 5; 11 who acquired Spanish and English from birth. As a result of this comparison, Silva-Corvalán (2003) found that the children with less exposure to Spanish at home displayed the same linguistic patterning as adults from the earlier study suggesting long-lasting effects of incomplete acquisition into adulthood: these children have not acquired a complete system of tense, aspect, and mood in Spanish and they showed a reduced Preterite-Imperfect distinction similarly to the adults from an earlier study by Silva-Corvalán (1991, 1994).

In a seminal sociolinguistic study, Silva-Corvalán (1994) documented language shift in the grammar of three different generations: first-generation Mexican immigrants arriving in the US, who grew up in a monolingual environment in their homeland and immigrated in adulthood; second-generation speakers who were born in the US or arrived in the US before they turned 11, and finally, the third generation of speakers whose parents were already born in the US. The third-generation heritage speakers displayed simplification of some parts of their grammar, i.e. preterit and imperfect morphology and in comparison to the first generation they would not use certain verbs in the preterit. For example, the third-generation speakers did not maintain the aspectual distinction between Perfective and Imperfective past tense forms in Spanish just like the first generation was able to maintain this distinction and they were extending the Perfective verb form where Imperfective form should be used. In another study, Silva-Corvalán (2018) compared recordings of 50 Spanish-English adult Mexican-American bilinguals with longitudinal data obtained during the first six years of life of two Spanish-English bilingual siblings and found incomplete acquisition in the Spanish grammars of the children for some specific properties, i.e. subject, verbal clitics and verb tenses by age of 6;0.

Similarly, Polinsky (2006) who investigated how the grammar of young adult Russian heritage speakers in the US develops under reduced input conditions, found that the least lexically proficient speakers exhibited most structural changes to their grammar in various areas such as nominal morphology, loss of verbal agreement as well as null subjects amongst other findings and that the more proficient the speakers were, the less reductions and simplifications or loss they displayed. As Montrul (2023: 404) concludes "this does not mean that heritage speakers with lower proficiency have acquired a "rogue" grammar or that their grammars do not fall within Universal Grammar (cf. Bayram *et al.*, 2019)", but "that many of the structural patterns exhibited by heritage speakers are systematic and arise from normal and natural processes of language acquisition and language change in a bilingual situation". The above studies show that the acquisition of certain structures have not yet been completed due to lack of sufficient input and that these effects can sometimes last till adulthood, i.e. when children acquire a part of grammar incompletely and then continue to use that part of grammar in the same way.

As another example, Polinsky (2008) demonstrated the differences in the gender marking system between Russian-English bilinguals and monolinguals in Russia and argued for the former to have incompletely acquired one of its elements. In this study, Polinsky (2008) looked at 12 adult heritage speakers of Russian in the US. They were tested on gender assignment in Russian which has three genders: masculine, feminine, neuter. Gender is assigned to each noun based on the final sound. Although this is not a challenging task for monolinguals for most of the nouns, there is a particular group of nouns ending in palatalized consonants that takes a long time to acquire for monolingual children, who in the very first stages of its acquisition tend to view these as masculine instead of feminine nouns. The monolingual Russian children make these types of developmental errors with nouns which they master in the end, whereas the Russian adult heritage speakers in Polinsky's (2008) study have not reached that final stage of development and that part of grammar, i.e. their gender remains incompletely acquired.

In another study, Montrul (2009) showed that Spanish heritage speakers had difficulties with subjunctive because Spanish monolingual children that were tested only showed a sustained knowledge of this feature after the age of 10. Montrul (2008) argues that, developmentally, heritage speaker children had not reached a certain milestone of language development when they lived in the majority country and that this process had not yet been completed to the same level that is found in the grammar of their monolingual counterparts. This means that a child heritage speaker has not been exposed to a grammatical feature enough for acquisition not only in the parents' speech, but also in the whole environmental or societal input as they simply had no time to learn a given feature (Montrul, 2008). What is important to remember is that not all of the properties of a grammar are acquired at the same time. This is especially observable with regard to some grammatical features that take a substantial amount of time to be acquired as

exemplified in the above study of subjunctive by Montrul (2008). As a result of insufficient input and exposure needed for the development of particular structures both in the spoken and written language these structures may not develop to the level that is expected. Similarly, other scholars who conducted the same comparisons to monolingual speakers (e.g. Polinsky, 2006; Silva-Corvalán, 2018a, 2018b) argue that the grammar that is found in heritage speaker bilinguals is incomplete due to the lack of sufficient input in the environment to develop the full L1 system (Benmamoun *et al*., 2013). Without adequate input and exposure, grammatical properties fail to develop to a level that is expected. By insufficient input researchers mean infrequent exposure to the heritage language. However, it is important to remember that this also includes restricted contexts (e.g. no schooling in the heritage language, no public presence of the language and interaction beyond home, no sizeable HL community etc.), which naturally ties in with issues concerning the quality of the input that child heritage speakers are exposed to.

To sum up, the above studies demonstrate that some of the structures were not fully acquired or mastered in the first place and that this acquisition was most likely interrupted by the exposure to the majority language. There are however numerous authors who have argued against this account (Kupisch, 2013; Pascual y Cabo & Rothman, 2012; Pires & Rothman, 2009) affirming that child heritage speakers only acquire what is present in their input (some children may not have access to language registers) and if this input is already different (for example a given property is already absent in their parents language), then it cannot be considered as incomplete. Flores (2014) questioned what the incompleteness in acquisition meant and whether it was suitable to explain that a heritage speaker has a deficient knowledge of their HL because they have not fully acquired it. Contending this account, Flores (2014: 4) stressed that "the fact that a heritage speaker uses a given structure in a target-like way in a particular context is, in itself, evidence that this structure has been acquired. Otherwise the speaker would not use it". Furthermore, as Flores (2014) points out, the fact that heritage speakers are reported to produce a given structure both in a target-like and target-deviant manner (i.e. they have the knowledge of it but do not always apply it correctly) means that explaining this outcome as incomplete is no longer the most valid interpretation. Flores (2014: 4) sees a speaker as being fully able to acquire a HL, but this process of acquisition is equally influenced by a substantial range of factors that lead to "divergent competence outcomes".

In the next section, I introduce the role of parental input.

2.4 The role of parental input

The parental input account stresses the importance of comparing the language of child heritage speakers to their parents and points to the divergences in the language of first-generation immigrants compared to second-generation. This proposal illustrates that "primary linguistic input to which heritage speakers are exposed to is qualitatively different from what monolingual speakers have at their disposal" (Bayram *et al.*, 2019: 457). It emphasizes the connection between the grammar of the parents and their heritage children as proposed by Pires and Rothman (2009) in the study of inflected infinitives in heritage speakers of Brazilian Portuguese and European Portuguese. In this study, parents of the heritage children who spoke Brazilian Portuguese did not use inflected infinitives (e.g. 2 SG *cant+a+r* (to sing), whilst the parents of heritage children speaking European Portuguese did use them in their speech (e.g. 2 SG *cant+a+r+* ***es***). In the latter variety, infinitives are still a part of it for the child heritage speakers whereas they are no longer used in the heritage Brazilian Portuguese. This was one of the first studies that brought attention to the language spoken by parents of heritage speakers and implied that their language should not be neglected as it is an important source of input for child heritage speakers considering that in their early years this is their main source of input.

In contrast to the theoretical proposal discussed in Section 2.3, researchers who stress the role of parental input (e.g. Pascual y Cabo, 2018; Montrul & Sanchez-Walker, 2013;) argue that the absence of the grammatical feature in question may be due to the fact that it simply does not exist in the input, i.e. in the parents' language, rather than in the heritage children's language. This proposal draws attention to the fact that the language that heritage children may be getting exposed to through their parents or heritage community is different from the language of the monolingual speakers in a given country. Rothman (2007) and Pires and Rothman (2009) illustrated that "if a property is not part of the register spoken to the heritage speakers, then it cannot be acquired" (Benmamoun *et al.*, 2013: 60).

This account stresses the importance of comparing the language of heritage speakers to the language of their parents and points to the divergences in the language of first-generation immigrants as a result of first language attrition (Montrul, 2016). These divergences could come as a result of prolonged contact with L2 environment and emigration. In this account, the atritting grammar of the heritage parents can lead to divergences in the grammars of the child heritage speakers which are revealed when compared to monolingual controls. Some studies have compared the language of heritage speakers to the language of their parents. For instance, Brehmer and Kurbangulova (2017) showed that the changes in voice onset time in heritage parents of Russian were also present in the speech of their child heritage speakers living in Germany and their Russian was influenced by German. In another study of first-generation

grammar, Montrul and Sanchez-Walker (2013) focussed on oral production of differential object marking (DOM), the overt morphological marking of animate direct objects in Spanish (e.g. *Buzz llevó a Woody* (ENG: *Buzz carried Woody*). In this study heritage children aged 6 to 17 from the US and monolingual children in Mexico completed a story retelling task and in the second part of the study young adult heritage speakers aged 18 to 25, adult immigrants in the US and natives in Mexico completed the same oral tasks. Results showed significant rates of omission of DOM in animate objects in all the experimental groups from the US and ceiling performance of the control groups. The first-generation immigrants to the US showed a significant rate of omission of DOM and Montrul and Sanchez-Walker (2013) concluded that rate of DOM omission in young heritage speakers in this study related to the grammar that they received, which was already lacking target-like DOM.

Another recent study that looked into the language of first-generation migrants, including some of the actual parents of heritage speakers is Wolski-Moskoff's (2019) study, who concluded that first-generation Polish speakers made some errors and heritage speakers displayed the same type of errors albeit intensified. The first-generation parents in this study had lived in the USA for 23.5 years on average. Wolski-Moskoff (2019: 263) concluded that "some aspects of heritage speakers' nominal morphology may be divergent because of the deviating input that they receive" and argued that "the language of first-generation immigrants underwent changes in regard to case use", i.e. their error rate held at 0.8% (with a very small number of examples where accusative was used instead of genitive and nominative instead of dative). The fact that they used them correctly significantly less frequently than did the controls per clause pointed according to Wolski-Moskoff (2019: 164) to "decreased language fluency rather than accuracy". As a result of this, Wolski-Moskoff (2019: 254) concluded that "the input that heritage speakers received during the language development was arguably different from that received by monolingual children, both quantitatively and qualitatively", although as she further admits, this cannot serve as a direct, but only a partial explanation for all the divergences that were observed in heritage speakers in that study.

On the other hand, some of the more recent studies on the role of parental input (e.g. Łyskawa & Nagy, 2019; Daskalaki *et. al*, 2020; Coskun-Kunduz & Montrul, 2022) found that the input that the heritage children are exposed to does not manifest any changes or simplifications of the structural patterns. Łyskawa and Nagy (2019) examined case-marking variation in heritage Polish, Russian, and Ukrainian and found no significant differences between homeland and heritage speakers. In fact, they observed that any variation in HLs was also noticeable in homeland languages (e.g. genitive – accusative substitution). Similarly, Daskalaki *et al*. (2020) who investigated subject placement among 39 heritage speakers of Greek in Western Canada (parents and school-aged children) and monolingual speakers of Greek in Greece (parents and

school-aged children) also have not found significant differences in the parental language when compared to their children. Coskun-Kunduz and Montrul (2022) looked at differential object marking in Turkish heritage speakers in the U.S. and found that the first-generation immigrants patterned with the monolingual adults meaning their language was not undergoing attrition.

Taking into account the above results, which on one hand claim that there is attrition from one generation to the other whilst on the other hand point to parents patterning with the monolingual adults, it is crucial to look at the language of heritage parents when studying the language of heritage speaker children due to the possibility of their parents' language undergoing changes as well due to the contact with the L2. In the next section, I discuss the process of attrition.

2.5 Attrition

Another possibility is that certain grammatical structures do get acquired but they are subsequently lost, in a process known as attrition (e.g. Polinsky, 2011; Montrul, 2002). This means that some of the elements that the heritage speakers previously acquired and used in their heritage language are subsequently lost. As Benmamoun *et al*., (2013: 28) explain, in order to classify a given grammatical property as lost "it must have been acquired, mastered and retained as part of the speaker's knowledge". However, it is often difficult to provide clear cut timelines for when each of these processes ends. Schmitt and Sorokina (2024: 134) emphasize that "attrition studies have consistently highlighted that exposure to another language can result in cross-linguistic influence (CLI) where features of L2 affect the L1 and vice versa in aspects of grammar/syntax (Ergün, 2021), pronunciation (Nagle *et al*., 2023), and/or vocabulary (Baladzhaeva, 2022; Fridman & Meir, 2023)". Furthermore, Hicks *et al*., (2024) conclude that if L1 and L2 are typologically similar and share grammatical properties, then attrition is more probable (see also Schmitt, 2024). Montrul (2002) demonstrated attrition of Spanish tense/aspect distinction in adult bilinguals. Polinsky (2011) showed that Russian heritage children living in the US displayed full mastery of relative clauses in Russian, whereas Russian heritage adult speakers presented markedly contrasting results. This means that what the heritage children had acquired and mastered, they eventually lost potentially due to limited use and limited exposure to input in their heritage language. This study included two different groups of participants and although by comparing child heritage speakers to the adult heritage speakers it was possible to separate attrition from incomplete acquisition, ideally more studies should be carried out using the same group of participants and following them throughout their lives, i.e. longitudinal studies which, to date, are lacking in heritage language acquisition research (Montrul, 2016). Longitudinal studies are required because as heritage language can

be so variable across individuals (e.g. some heritage speakers can perform exactly like monolinguals whilst some are at the other end of this continuum (Polinsky & Kagan, 2007)), comparing two groups of different individuals rather than the same speakers over time, may not necessarily be as valid comparison considering that the individuals from within each group are likely to behave differently from each other. Some properties may also be subject to longer maturational schedules which means that more time is needed for a given property to be acquired and retained. Longitudinal studies can help differentiate whether some heritage speakers incompletely acquired features to begin with or whether they have acquired them but are later showing signs of attrition.

The start of schooling (which often signals the exposure to the majority language and a change in the input that child heritage speakers receive) has been pointed out by researchers as a possible cause for attrition in their grammars due to the exposure to the majority language and decreasing input in their heritage language (e.g. Polinsky 2011; Montrul, 2002). It is clear that starting school (around the age of 4 or 5) is a crucial event in the life of child heritage speakers which deserves attention to understand the development of their heritage language. Montrul and Polinsky (2019: 427) propose that "what causes severe L1 attrition is reduced input and lack of consistent and sustained exposure to and use of the L1 during a time when the native language is not fully fixed in the brain, most likely before and around the closure of the critical period (puberty). The L1 is used less because children growing up in an L2 environment spend most of their waking hours using the L2 at school and with peers, at the expense of the L1". They further stress that "the younger the individual when reduction of input and lack of use of the L1 take place, the more severe the extent of language loss at the grammatical level, such that the effects of L1 attrition in childhood are more dramatic than in adulthood" (Montrul & Polinsky, 2019: 427). This is an important point in the case of simultaneous and sequential bilinguals where the latter group has been shown to have a higher proficiency in their heritage language than the previous group who did not experience as much exposure to their heritage language to start with (e.g. Montrul, 2008; Montrul & Sanchez-Walker, 2013). Polinsky (2018: 23) explains that "prepubescent children tend to lose the L1 skills more quickly and to a greater extent than people who moved as adults and whose L1 was fully developed on migration" which means that "the extent of attrition and severe language loss is more pronounced in children younger than 10 or 12 years of age than in individuals who migrated after puberty" (e.g Flores, 2015). Extreme cases of international adoptees are an example of when language attrition can become severe due to interrupted input in that language in childhood. In their longitudinal study, Kubota *et al*. (2022) examined the development of narrative micro- and macrostructure in Japanese-English bilingual returnee children who were all born in Japan and acquired English upon arrival to an English-speaking environment in early childchood. The returnees did a narrative task in both

their L1 (Japanese) and L2 (English) at two different points in time, i.e. when they returned to their native country and the following year. The results showed no significant changes in L1 or L2 micro- and macrostructure over time but individually, those children who continued to be exposed to English (L2) after their return, showed better English language maintenance despite reimmersion in Japanese (L1). The two factors that predicted the development of their L1 was age of return to Japan and relative proficiency. Most importantly, this study pointed to different background variables affecting the change in returnee children's L1 and L2 narrative abilities. In another study, Kupisch *et al*. (2021) looked at heritage children at several moments of their development (although it has not followed the same group) and investigated global accent in the two languages of Russian-German heritage children living in Germany of two groups aged 4-6 and 7-9, i.e. pre-school with primary children. The results showed that with time, older children sound less accented in their L2 than the younger children, while they sound more accented in their L1 as the time goes by suggesting that primary school years are crucial for HL maintenance. Montrul and Polinsky (2019: 428) argue that "input factors and use of the heritage language in the immediate family and school context and in the broader socio-linguistic context contribute to the acquisition and development of specific grammatical properties of the heritage language grammar". Investigating heritage grammar acquisition during the start of schooling allows us to observe what happens in a situation of reduced heritage language input in child HLA as "using the heritage language less during this critical time has dramatic consequences for language development" (Montrul, 2023: 401). Some researchers have also pointed out that attrition is a complex process that is "multifaceted and cannot be attributed to a single causal factor. It involves a complex interplay of linguistic, cognitive, sociolinguistic and extralinguistic variables" (Schmitt, 2024: 137). More recently, researchers in the field of HLA have been focussing on the effects of internal and external factors, which I introduce in the next section.

2.6 Research on HL development in school-age children and the effect of internal and external factors

In recent years numerous studies have been published regarding child heritage speakers in the European context that analyse the effect of input and schooling, as well as other language-internal and external factors. The conditions for language learning that HL speakers experience (including child heritage speakers) involve reduced exposure to the HL, fewer speakers and opportunities to practice their HL in a more limited number of settings such as community, HL schools and closest family. As a result of these factors, heritage speakers' experiences with the HL vary greatly and lead to varying HL proficiency and outcomes (Paradis, 2023). Examples of internal factors include: AoA or cognitive abilities (e.g. verbal short-term memory) and external

factors regard environmental factors (encompassing the quantity and quality of linguistic input in each language) (Paradis, 2023). As previously mentioned, these factors account for individual variation and allow for ID approach which means that within-child and within-group comparisons are possible, and view child heritage speakers as not lacking when compared to monolinguals, but different. Below, I review some of the research that examines how some ID factors modulate performance of child heritage speakers on a language task.

Rodina *et al*. (2020) investigated data from five separate studies regarding the acquisition of grammatical gender in Heritage Russian (HR) among heritage children in five countries: Germany, Israel, Norway, Latvia, and the United Kingdom. This investigation focussed on both language-internal factors (cross-linguistic influence) and language-external factors (such as family background, age at the start of pre-school, size of the heritage language community, exposure to HR instruction and the main language of instruction). The results of this analysis showed no significant cross-linguistic influence from the majority languages, indicating that gender acquisition in HR is primarily driven by the gender cues in Russian and the amount of exposure to the language. Key external factors influencing gender acquisition included family type, age, and current exposure to HR instruction (meaning that the probability of developing a reduced gender system in HR is predicted by these variables).

In another study, Kupisch *et al.* (2021) investigated Russian heritage children in Germany and their perceived global accent. This study compared pre-school children (ages 4-6) and primary school children (ages 7-9). The findings indicated that older children sounded less accented in German but more accented in Russian compared to younger children. This suggests that primary school years are critical for heritage language maintenance. The study highlights that bilingual children are often perceived as having a foreign accent in both their languages, with the incidence of perceived foreignness decreasing in German and increasing in Russian as they grow older. The research underscores the influence of the majority language on the heritage language and the importance of early and consistent exposure to both languages.

Chondrogianni and Daskalaki (2023) examined how heritage language (HL) experiences and outcomes in Greek-English bilingual children in North America are influenced by their generation and visits to their homeland. The study involved 58 children (aged between 6;5 to 18;8) from second, mixed, and third generations of Greek heritage. This study concluded that early HL use remains high across these generations, but current HL use and richness decrease significantly by the third generation. Third-generation children showed lower accuracy in HL vocabulary and syntax, particularly in discourse-conditioned structures. Crucially, it was demonstrated that short visits to the homeland significantly boost HL outcomes, especially in vocabulary and syntax-discourse structures, highlighting the importance of diverse and native

input. This study emphasizes the role of both HL use in the country of residence and short-term re-immersion in the homeland for maintaining and improving HL proficiency across generations.

Torregossa *et al.* (2023) in their study of heritage Portuguese in Germany, found that formal instruction and number of HL speakers, rather than home language use, were predictive of children's performance in late acquired complex syntactic structures. The study investigated the acquisition of difficult linguistic structures in heritage Portuguese among children in Switzerland who speak French, German, or Italian as their societal language. Using a cloze-test, it examined how language exposure, age, and formal instruction affect language competence. Crucially, this study found that older children and those with more formal instruction in their heritage language (Portugese) perfomed better, and that richness of language exposure (i.e. both family and wider HL community) was a significant factor. It also suggests that internal language factors were more influential as no significant cross-linguistic influence was found.

In line with other studies (e.g. Gollan *et al.*, 2015; Jia & Paradis, 2015; Torregrossa *et al.*, 2023), Correia, Lobo and Flores (2024) found that richness of the HL input emerged as a significant predictor of the bilingual children's accuracy in a sentence repetition task of 25 bilingual heritage speakers of European Portugese with German as societal language (aged 6 to 10). As such, the richness of HL input may indicate the number of HL interlocutors interacting with child heritage speakers, the frequency of their engagement with HL sources (e.g. media, books), the size of the migrant community or the type of HL instruction.

Sopata, Rinke and Flores (2024) investigated the acquisition of referential expressions for direct objects by child heritage speakers of Polish living in Germany comparing the data of four age groups of bilingual children (aged 3 to 10). The results showed that child heritage language speakers of Polish displayed knowledge of semantic and pragmatic constraints of object realization from early stages (i.e. they develop in a parallel way as monolinguals at the earliest stage). However, from age 5 and up to age 9 to 10, they still produce high rates of inappropriate null objects and show a deceleration in the development of this knowledge, compared to monolingual children. This protracted development is attributed to reduced input in the HL, mainly due to the enrolment in the majority language school.

The above studies on HL development in school-age children confirm how acquisition outcomes in heritage speakers are determined by language external and internal factors, and indicate the factors which contribute to developmental rates and outcomes (e.g. family type, HL instruction, frequency of engagement with HL sources or homeland visits). Therefore, the importance of taking these variables into account cannot be overstated.

2.7 Summary

In this chapter, I have discussed key theories of heritage language acquisition: incomplete acquisition, parental input and attrition. In this study, I will attempt to address them in order to investigate which of these accounts is supported by the findings arising from this study. I have also argued that it is crucial to investigate heritage children who start school (particularly in a longitudinal manner) in order to try and fully understand how their heritage language develops. The three accounts discussed give rise to some predictions. Regarding the first account the prediction is that if the heritage children show reduced accuracy in task performance as compared to monolingual children in Poland at the beginning of the school year (Time 1), then this could mean that the case acquisition is ongoing - delayed. Secondly, the next prediction is that if Polish heritage children in the UK perform the tasks with high accuracy at the beginning of the school year (start of the Reception – Time 1), but then at the end of the school year (Time 2) show changes in their task performance, then these changes could be a sign of the onset of attrition. If no changes in particular cases can be observed in the parents' native language when compared to a group of monolingual Polish adults in Poland, but the heritage children show reduced accuracy in task performance in Time 1, then parental input effects are less likely to be a factor. In the next chapter, I introduce the linguistic property I will be investigating in this study.

Chapter 3 Case marking and its acquisition

3.1 Introduction

We know from second language acquisition literature that inflectional morphology is challenging to master (Slabakova, 2008) and in the heritage language literature it has also been pointed out that nominal morphology is a vulnerable area of heritage speakers' grammars, with case regarded as its most vulnerable nominal element (e.g. Chondrogianni & Schwartz, 2020; Laleko & Polinsky, 2016; Polinsky, 2006). Particularly relevant for the current study, studies on Polish heritage speakers' nominal morphology document the fragility of nominal inflectional morphology with regards to case marking in adults (Koźmińska, 2015) and in children (Laskowski, 2009). Before I discuss these studies in more detail, first I explain what case is and how to account for case within a feature-based generative theory of syntax in Section 3.2. In Section 3.3, I describe case in Polish and case in English. In Section 3.4, I present a summary of the acquisition of case in Polish monolingual children. In Section 3.5, I evaluate previous research on Polish heritage speakers' acquisition of this property and on other Slavic heritage speaker populations. Finally, in Section 3.6, I present a summary of this chapter.

3.2 Definition of Case

As defined by Blake (2001:1) case is "a system of marking dependent nouns for the type of syntactic and/or semantic relationship they bear to their heads (the verb (e.g. ***ride*** *a bike*)) or the preposition (e.g. ***on*** *the bike*)". Some of the possible examples of cases include: nominative, accusative, genitive, dative, locative. To have a nominative case indicates a subject of a finite verb; accusative indicates a direct object of a verb; genitive indicates possession; dative indicates indirect object of a verb and locative indicates location – these are the main roles, though different languages use different cases to express different purposes. According to the widely accepted view of case, syntactic positions in a clause may be treated as case (Kibort, 2008) and if we adopt the above definition, it transpires that "[l]anguages may choose to encode this relationship [*i.e. case*] either structurally in terms of designated positions or via overt morphological markers" (Butt 2006: 4). For example, Example 1 and 2 have the same meaning (*The child has a cat*), yet Polish shows a relatively free word order. Examples 1 – 3 show how this relationship is encoded structurally in English; in order to be interpreted with the appropriate nominative case on 'the child' and accusative case on 'a cat', the word order has to be SVO, as in (1). The SOV word order in (2) is ungrammatical, and the OVS word order in (3) is only grammatical if 'the cat' has nominative case and 'child' is accusative:

1) The child has a cat

2) *The child a cat has

3) *The cat has a child

In Polish, on the other hand, case is encoded via overt morphological markers, which in turn allows for a more free word order. Example (4) shows the basic word order pattern in Polish, which is also SVO. However, note also the morphological endings indicating case on the nominative and accusative nouns (-o and -a). This overt morphology means case is interpretable regardless of the position of the noun in the clause, and word orders such as (5) and (6) are available to give different emphasis while retaining the same grammatical relations:

(4) Dziecko ma kota
the child.NOM have.3SG cat.ACC

(5) Dziecko kota ma
the child.NOM cat.ACC have.3SG

(6) Kota ma dziecko
cat.ACC has.3SG the child.NOM

In terms of its syntax, case is encoded as a morphosyntactic feature. Chomsky (1991, 1993) proposed a standard theory of case assignment where case is assigned by means of feature checking. There is an unvalued case feature on the DP, which enters into a c-command or Spec-head relationship with a particular functional head, and subsequently has its case value assigned by the head. For example, nominative case is assigned by T to the nearest DP (subject). Universal Grammar allows case to be expressed either synthetically (as affixes on nouns) or analytically (by means of prepositions or other syntactic heads that take an entire noun phrase as their argument (Santorini & Kroch, 2007). It is possible to describe both expressions of case in a unitary way by treating case as a feature on a noun phrase that is checked by a head (Santorini & Kroch, 2007).

According to the standard case theory (Chomsky, 1995, 1998, 2000), case is divided into structural cases and non-structural or lexical cases. The former are assigned or checked in particular structural positions whilst the latter are licensed in connection with theta-licensing (assigned to a nominal expression by a specific lexical item (a verb or a preposition) (Pesetsky &

Torrego, 2012). For example, the verb *pomagać* in Polish takes a dative argument, while the verb *piec* in Polish takes an accusative argument which requires a structural case. English has only structural Case (nominative, accusative and genitive) (Woolford, 2005) whilst Polish has both types of Case (Franks, 1995; Przepiórkowski, 1999). Due to the way these cases are assigned, structural case is the most regular followed by the lexical case (Woolford, 2005). Rutkowski (2002: 5) further indicates that semantic markedness can explain the dichotomy between structural and lexical cases (cf. Greenberg, 1966). Cases can be ranked in terms of cognitive, perceptual complexity (connected with the semantic notions expressed). The structural case seems to be far less complex semantically than the lexical case (as mentioned above, the structural case could be viewed as a mere reflection of surface syntactic relations in a sentence) and the morphological realisations of the lexical case are typically more complex than the structural case forms in Polish. In this thesis, I will be looking at examples of structural and lexical case.

Below, I introduce case in Polish and case in English.

3.3 Case in Polish and case in English

Polish belongs to the Slavic language family whereas English belongs to the West-Germanic branch of the Indo-European language family. Polish is a synthetic language (i.e. containing many inflections, some of which have more than one function and more than one form) whereas English is an analytic language (i.e. containing few inflections, characterised by fairly fixed word order), a distinction which affects how the case forms are expressed in these two languages. With only very few exceptions, nouns do not carry many morphological affixes in English to show what their role is in the sentence (i.e. subject, direct object, indirect object etc.). Instead, this information is generally expressed by specific word orders (i.e. word order indicates different syntactic relationships). In Polish in contrast, morphological affixes are what indicates different syntactic relationships in a sentence – a noun to a verb at the clause level or a noun to a preposition, postposition or another noun at the phrase level. The syntax-semantics mapping in Polish is always realised overtly by adding singular or plural endings (excluding a zero nominative suffix, see example 13 below). The Polish case system is very rich and complex with overt morphological expression whereas in English case is not overtly expressed in most of the cases with the exception of pronouns. Example (7) and (8) shows that in English the noun ‘son’ (Polish: ‘syn’) retains the same form to mark both the subject and indirect object:

(7) My **son** took the book.

(8) I gave my **son** a book.

In Polish, however, whilst 'syn' marks the subject as in example (9), in order to mark the indirect object this noun changes its form as we can see in the example (10).

(9) **Syn**.NOM wziął książkę.
'A son took the book'.

(10)	Dałam	mojemu	syn**owi**	jego	książkę.
	Give-PAST-1-SG	POSS-1-SG-DAT	son-DAT	POSS-1-SG	book-SG-ACC
	'I gave my son his book'				

Below, I focus on case in Polish first before I present case in English.

3.3.1 Case in Polish

In Polish, there are 7 cases: nominative, accusative, genitive, dative, locative, instrumental and vocative and each case has a set of endings based on gender and number (Sadowska, 2012; Swan, 2003). There are two numbers in Polish: singular and plural and there are 3 main genders in Polish: feminine, masculine and neuter. The masculine nouns are further divided into: personal, animate and inanimate categories. The 7 cases available in Polish, their functions and some possible forms (according to number) are found in the Table 1 below.

Table 1 Polish cases and their usage including their endings in singular and plural

Case	Main use(s)	Singular endings for both genders	Plural endings for both genders
Nominative	Subject	Ø, -o, -e, -ę, -a	-owie, -y, -i, -e, -a
Accusative	Direct object; with certain prepositions	Ø, -a, -o, -e, -ę,	-ów, -y, -i, -e, -a
Genitive	Possession; direct object of a negated verb; modifier of an NP; object of certain verbs	-a, -u, -y, -i	Ø, -ów, -y, -i
Dative	Indirect object	-owi, -u, -e, -y, -i	-om
Locative	Location – used with certain prepositions (*of, in, at, on*)	-e, -u, -y, -i	-ach

Case	Main use(s)	Singular endings for both genders	Plural endings for both genders
Instrumental	Subject predicative; object of certain verbs	-em, -ą	-ami
Vocative	Form of address	-e, -u, -o, -e, -ę, -y, -i	-owie, -y, -i, -e, -a

Each of the seven cases change their endings based upon their grammatical function (or the grammatical function of the words they modify) in the sentence. As stressed by Janssen (2016: 16) "in Polish gender, case and number have to be marked morphologically on the noun by means of a suffix." Examples 11 and 12 illustrate how markings are added to the nouns:

(11) Mam**a** lubi muzyk**ę**.
mum.NOM like.PRES.3SG music.ACC
'Mum likes music'

(12) Dzieck**o** siedzi na łóżk**u**.
child.NOM sit.PRES.PROG.3SG on.PREP bed.LOC
'The child is sitting on the bed'

There are also some examples in Polish where case distinctions are marked redundantly on the noun. This is illustrated in (13). Ø indicates a zero nominative suffix:

(13) Nominative kot- Ø, uczeń-Ø
cat-NOM, student-NOM

Table 2 illustrates how one of its nouns in Polish ('pies') takes a different form to mark different uses.

Table 2 Inflection of the noun dog in Polish.

Case	Singular		Plural	
Nominative	*pies*	[EN: dog]	*psy*	[EN: dogs]
Accusative	*psa*	[EN: dog]	*psy*	[EN: dogs]
Genitive	*psa*	[EN: dog]	*psów*	[EN: dogs]
Dative	*psu*	[EN: dog]	*psom*	[EN: dogs]
Locative	*psie*	[EN: dog]	*psach*	[EN: dogs]
Instrumental	*psem*	[EN: dog]	*psami*	[EN: dogs]
Vocative	*psie*	[EN: dog]	*psy*	[EN: dogs]

In Polish case is assigned in a process of feature valuation in which a head values the [uCase] feature on the nominal. In the nominative, the [uCase] feature on the subject DP is valued by the finite verb in T. This is an instance of structural case assignment. The Case feature is valued as Nom, and the DP will be spelled out with the appropriate nominative morphological affix, regardless of whether the nominal moves within the structure. This is shown in Figure (1)[2].

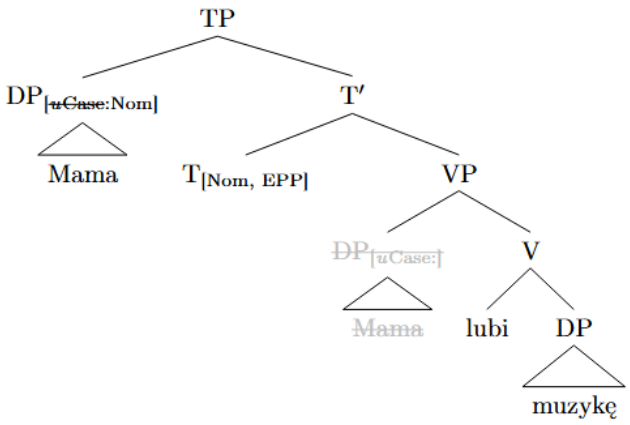


Figure 1 Tree structure for example (11): *Mama lubi muzykę* 'Mama loves music'

With regards to genitive in the possessive, Polish has a [uCase] feature on the noun which is valued as [Gen]. Following Witkoś and Dziubała-Szrejbrowska (2015), the way in which this occurs varies depending on whether the possessor is a pronominal or full noun phrase. I focus only on the full NP examples, in which case is assigned to the possessor by the D head; the possessed NP also raises to the specifier of a function projection (FP) above DP, giving the word order seen in example 14. This is shown in Figure 2.

(14) Siostra Janka

sister.NOM Janek.GEN

'Janek's sister' (Witkoś 2021:5)

[2] Although Polish has relatively free word order, the baseline is SVO and the subject is assumed to be in SpecTP (e.g. Witkoś & Dziemianko (2006); Wiland 2010)). Polish has V-to-v movement (Witkoś, 2007); however, for the purposes of the discussion here I ignore the v layer as it does not affect the assignment of the three cases I am interested in.

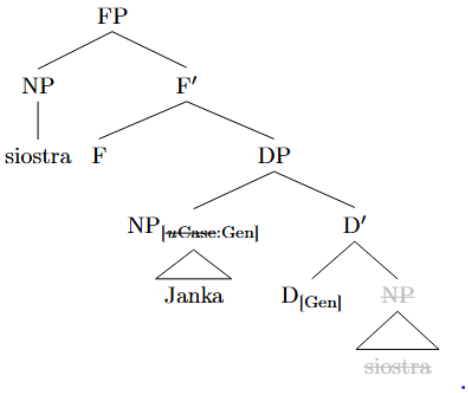


Figure 2 Tree structure for example (14): *siostra Janka* 'Janek's sister'

Again, this is an instance of structural case assignment, and Polish has a morphophonological spell out of this genitive feature (various forms).

In Polish, locative is a lexical case. It denotes location (where and wherein) and it must be used with a preposition. Furthermore, it is only assigned by specific prepositions such as *na (on), przy (by), w (in), po (after), o (about, at),* rather than by the functional P head. This is shown in Figure 3.

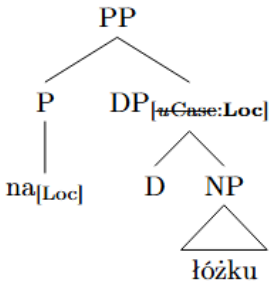


Figure 3 Tree structure for the PP in example 12: *na łóżku* 'on the bed'

There is subsequently morphophonological spell out of the Polish feature in the relevant affixes and/or stem changes.

3.3.1.1 Case syncretism in Polish

As we saw in Table 1, there are a wide range of suffixes available on Polish nominals depending on the case, gender and number of the noun. Notably, "on suffixes, the information pertaining to these categories (gender, case and number) is fused and expressed in one ending. Thus, gender cannot be separated from case and number, and case cannot be separated from gender and number. Moreover, in these systems, only few endings are truly transparent in the sense that they are non-syncretic and non-homophonous without context" (Janssen, 2016: 16). Due to this,

it is not possible to consider case strictly in isolation. Each noun belongs to a declensional class/paradigm based on its morphological gender, as indicated by the case endings in the singular and plural forms and they are also marked for animacy, which is applicable to just the singular in the masculine accusative case (Janssen, 2016). Krajewski *et al*., (2012: 11 cf. Dąbrowska (1997) explains that "precise definitions of the case categories are difficult, if not impossible, due to fuzzy differences between the contexts within categories". Krajewski *et al.,* (2012) further outlines the rules regarding the same case-number combination and stresses that it can be marked by different endings with a complex set of criteria governing the proper choice (grammatical gender, semantics, phonology) and that there will be instances where there are no clear criteria meaning that the same ending may mark different inflections (i.e. case-number combinations), sometimes for different classes of nouns and at other times within the same class of nouns. Polish cases have more functions than the actual affixes available. The multifunctionality of morphemes leads to case syncretism, "owing to the fact that most cases have more than one morpheme, one syntactic function may be represented by several different affixes" (Wolski-Moskoff, 2019: 79). Whatsmore, in Polish "obligatory morphophonological alternations in the stem occur as a result of inflectional changes. There are two types of morphophonological stem alternations involving both consonants and vowels. In Polish, adding or changing an inflectional suffix may lead to a different realistion of the stem-final consonant" (Janssen, 2016: 23). Example 15 shows how this is realised:

(15) but - Ø — buci-**e**
Shoe- M.Sg NOM — shoe-M.Sg.LOC
/t/ becomes /ć/

This syncretism does not affect how case is assigned, but just that the morphological exponent at spell out is dependent on multiple properties (case, gender and number).

3.3.2 Case in English

In English, there are three main cases: nominative, marking the subject of a finite clause; accusative, for nominals in an object position, and genitive, marking the possessive (Kibort, 2008). Unlike in Polish, English generally does not have overt morphological case marking on nominals (nor their dependents, such as determiners and adjectives), apart from the genitive, which is marked with the possessive ('s), e.g. dog's[3]. However, note that personal pronouns do

[3] Case is marked on pronominals in English.

display overt morphological case (nominative – for subject pronouns, e.g. she, we to mark the subject of a finite verb and in some cases to mark the complement of a copula; accusative – for object pronouns, e.g. her, us to mark direct or indirect object of a verb, to mark the object of a preposition, to mark an absolute disjunct and in some cases to mark the complement of a copula and finally genitive case – for possessive pronouns, e.g. her/hers, our/ours (the possessor inside DP)).

(16) She [case: Nom] saw Lewis.

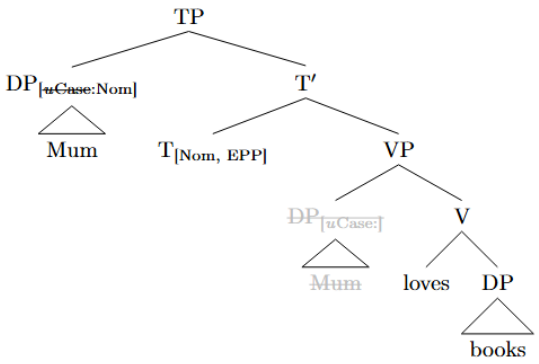
(17) Lewis saw her [case: Acc].

(18) Lewis saw [DP his [case: Gen] cat].

However, the lack of overt case marking on English nominals does not mean that English nouns do not have a case feature. Although in many languages (such as Polish), case is visible in the form of overt morphology, in generative grammar it is assumed that every overt NP must be assigned Case, which is known as the Case Filter (Chomsky, 1981). This has two relevant implications: firstly, that abstract Case exists regardless of whether or not there is overt morphology marking it, and secondly that an NP must occupy a position to which a Case feature is assigned at some point in the derivation (Pesetsky & Torrego, 2012), in order not to violate the Case Filter. In many ways, then, case in English is assigned in the same way as Polish – it is a process of feature valuation in which a functional head values an uninterpretable Case [uCase] feature on a nominal. However, unlike Polish, English only has structural case (Woolford, 2006), meaning that the case is always assigned by a particular relationship within the syntactic structure.

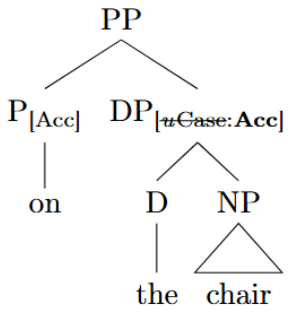
Regarding the nominative case in English, there is a strong feature on T requires that the DP subject to move to SpecTP[4]. In this position, the [uCase] feature is valued with nominative case by T in the Spec-head relationship. This is shown in (19):

[4] This strong feature may be an EPP feature (e.g. Chomsky, 1995), or a necessary component of case or phi-feature valuation (e.g. Epstein & Seely, 2006; Boeckx, 2008). Here, I assume an EPP feature.



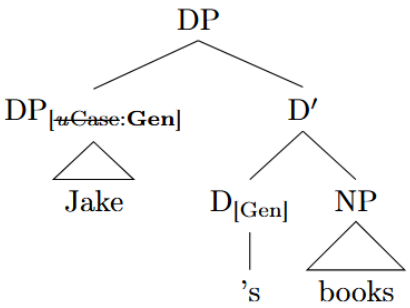
(19)

For accusative case, both v and P assign an accusative case feature to their complement NP. This means that both in object positions and within preposition phrases in English, the complement DP is in accusative case—recall that in Polish, prepositions like [*na, przy, po, w, o*] assign locative case. The English accusative case assignment is demonstrated in (20):



(20)

Finally, with regards to the genitive, the present day English genitive *'s* developed from the Middle English genitive suffix into a head of its own right. This *'s* is a determiner which sits in D and is marked with a genitive case feature (Santorini & Kroch 2007). This case feature then values the [uCase] feature on the DP which sits in the specifier of DP. This is shown in (21).



(21)

In summary, from the above sections, it transpires that there are some differences and similarities in the way that cases are expressed and operate in Polish and in English and that the syntax of case is the same in both languages, but the morphological expression of the same features is different. Next, I discuss how Polish monolingual children acquire case in Polish.

3.4 The acquisition of case in Polish monolingual children

Even though cases in Polish are complex, Polish monolingual children acquire cases rather early on. The acquisition of cases is supposed to be complete by the age of 4 (e.g. Dąbrowska, 2006, Krajewski, 2012, Łuczyński, 2004, Smoczyńska, 1985), although some of the most complex case functions are said to be complete by the age of 6 (Łuczyński, 2004). Researching spontaneous speech of monolingual Polish children, Smoczyńska (1985) suggests very early mastery of case marking system with main singular markers (nominative, accusative and genitive) and the nominative and accusative plural emerging before the age of 2, which are then followed by the remaining singular case inflections. What is more, these endings are used correctly from the very beginning with some exceptions where children make few errors in some isolated areas, but these error rates are extremely low (this has also been shown by Dąbrowska (2001; 2004)). If they do make errors these mostly consist of applying endings of the wrong declensional pattern to nouns; whatsmore, monolinguals never replace other cases with a nominative case. Wolski-Moskoff (2019:119) also concludes that "research on monolingual case acquisition suggests a very low error rate and a general lack of case substitution. The errors that were observed in Polish monolingual children pertained to the use of endings for a different gender or reduction of allomorphy (i.e. the tendency to use fewer endings in the locative case, e.g. *rzekie* as well as supplying the wrong gender endings for a particular case (Łuczyński, 2004; Smoczyńska, 1985)". The complexity of the Polish case system lies in the fact that there is less transparency due to three properties, i.e. gender, number and case, being expressed by one inflectional suffix, meaning they are not always distinct morphophonological forms, especially if we take into account how syncretic the Polish case system is as referred to in section 3.3.1.1. For this reason, it is not always clear whether any of the errors that monolingual children make are due to the incorrect declensional class or the incorrect case function (Janssen, 2016). From the existing literature in this area, it appears that there are conflicting opinions. Some argue that Polish monolingual children do not know the case functions and the errors they make are as a result of competence. Others propose that these are performance errors as a result of Polish children having not mastered the variety of endings

of an individual case but having mastered the correct case contexts (Janssen, 2016). This distinction is important for language acquisition because if the monolingual speakers make errors as a result of either competence or performance then this has to be taken into account when considering the language of heritage speakers.

However, acquisition of the less frequently used functions of cases and irregular inflections may continue until children are six years old, and monolingual children also acquire case markings before they are able to know all their functions (Łuczyński, 2004). Even though, as Łuczyński (2004) claims, it is impossible to provide clear cut off points for the emergence of each of the cases, there is a certain order in which these cases are acquired with nominative, accusative and vocative being acquired first (end of 2nd year) which confirms Smoczyńska's (1985) findings. After this, children use most case markers correctly and do not use one case in place of another (i.e. there is no case substitution (Krajewski, 2011; Łuczyński, 2004)). Any errors that are reported with the noun inflection in that time regard masculine inanimate nouns "due to combinations of several of factors: type frequency, phonological structure of the domain of application, phonological salience of the affixes, participant's reliance on product-oriented schemas" (Dąbrowska, 2006:129), however, they are not frequent (Łuczyński, 2004). Janssen (2016: 63) also concludes that the monolingual Polish children start acquiring the case system before the age of 2 and in the most pessimistic view acquire the core functions before age 3;6. As far as the research on the emergence of each particular case in monolinguals is concerned, Łuczyński (2004) explains that this sequence is debated in the field of Polish language acquisition; however, this author mentions that locative seems to appear as one of the last cases in its full form with a preposition. At this point, it is worth mentioning that there are also other cases in Polish that can be used with a preposition such as genitive, dative, accusative and instrumental. Łuczyński (2004) further points out that locative is less frequent in the speech of 2 year olds, despite the fact that it appears at the age of 2. What is interesting is that the first forms of locative appear without the preposition. At this stage a monolingual child seems to be treating locative case and its preposition as one form describing location where locative case is more preferable than the preposition and using the preposition at a later stage is the next stage in the development of grammatical competence for a monolingual Polish child (Łuczyński, 2004). This means that at this point the children understand the semantic-syntactic relationship between the preposition and the locative case ending and the requirement of these elements (Łuczyński, 2004). The same author further demonstrates based on speech data from children aged 2 to 6 (see Table 3 below) that they show varying demand for case use, which would mean that children at certain age consider certain cases less or more useful. From Table 3 (containing nouns from a narrative story telling task), we can see that the use of nominative increases and then decreases as children get older, whilst the use of genitive and locative keeps increasing as

children grow older (within the specified age frame in that particular study as no more data is available beyond the age of 6). Łuczyński (2004) also mentions that the use of singular nouns is much higher (78.4%) than use of plural nouns (21.6%) which is also likely to affect the inflection of nouns in plural. When Łuczyński (2004) summarised the use of all cases in Table 3 below, he concluded that they ranked in the following order from the most frequent in 2 to 6 year old children (nominative, accusative, genitive, vocative, locative, instrumental and dative).

Table 3 Number of cases used by monolingual Polish children from 2 to 6 (Łuczyński, 2004: 82)

Case	*2 years*	*3 years*	*4 years*	*5 years*	*6 years*
Nominative	304	333	364	330	294
Genitive	110	92	101	133	154
Dative	14	8	9	6	14
Accusative	315	282	321	315	331
Instrumental	18	25	89	84	93
Locative	24	65	86	128	106
Vocative	215	205	29	3	0

Łuczyński (2004) compared the frequency of cases in the speech of monolingual Polish children with that of monolingual adults and provided the following ranking signalling slight differences: genitive, nominative, locative, accusative, instrumental, dative and vocative, bearing in mind that the data for adults comes from the written language as opposed to their speech so this is not fully comparable. We can see that this frequency is slightly different between the monolingual children and adults. As far as pattern frequency is concerned, the less frequent features are less salient than the features that appear frequently in the input. Following Goldschneider and DeKeyser (2001), due to this saliency, these forms are acquired more quickly. This has been documented by Dąbrowska and Tomasello (2008) who mention the instrumental case in Polish as an example of a case which is infrequent and acquired later by monolingual children than more frequent cases in Polish such as nominative, accusative or genitive. As far as genitive is concerned, the earliest function it appears in is possessive, hence its early acquisition means it should not be the most difficult case function for bilingual children. Łuczyński (2004) confirms that the most dominant prepositions used in the speech of monolingual children acquiring locative are '*na*' (on) and '*w*' (in). The less frequent prepositions used with locative are '*przy*' (by) and '*po*' (after). Łuczyński (2004) confirms that the sequence in which the cases appear in the speech of monolingual Polish children is based on how easy they are to acquire. With locative, monolingual children use diminutives as these do not require the phonological alternations and surprisingly plural locative case inflection is easier because it

does not require the phonological alternations and there is only one ending. Janssen (2016: 5) refers to Goldschneider and DeKeyser (2001) who propose that "the morphophonological regularity of a grammatical feature contributes to its transparency". What is more, Janssen (2016: 6) further stresses that "morphophonological regularity is negatively affected by allomorphy: grammatical features that are expressed with a higher number of phonological alternations are more difficult to acquire". Łuczyński (2004) concludes that it is difficult to specify that case acquisition in Polish is complete by a certain point, however he confirms that it is less intensive as monolingual children grow older and based on the analysed case acquisition data he proposes that monolingual children are incredibly advanced in case marking and that it is no different to the case marking of adult monolingual speakers of Polish.

In a study of a 2-year-old child, Krajewski (2012) showed that the child can use all cases in both numbers (singular and plural), with virtually all endings possible and only made a highly limited number of morphological errors (i.e. supplied a wrong ending to a given stem). Whatsmore, their use of those inflections, as compared to adult speakers, was, in fact, restricted in terms of the noun stems they combined with as well as in terms of contexts they occurred in. Krajewski's (2012) findings are based on a densely and systematically sampled dataset and this is the first corpus of child Polish of this quality available in the field. It is also based on sophisticated quantitative methods, involving using adult input as a baseline for analyses and controlling for potentially biasing factors to ensure fair comparison. As Janssen (2016: 48) concludes "a young child is not exposed to the individual inflectional endings in equal amounts. It is possible that frequency also influences acquisition." Janssen's (2016: 49) study involves older children, i.e. 4-6 year olds, and for these children "the proportion of the input in each oblique case is not yet known". Another point worth mentioning is that child directed speech in Polish contains a lot of diminutives and their effect is said to be positive in "regularising the input and fostering quick acquisition of the declensional patterns" (Janssen, 2016: 50) and according to Smoczyńska (1985) monolingual children revert to using diminutives as a strategy to avoid using any case inflections that might be possibly causing them difficulty.

In summary, despite the complexity of the Polish cases, Polish monolingual children acquire them fairly early even though the use of some of the more complex case functions may go little bit beyond the age of 4 and there is no sign of using one case as a default. However, as testing of all the cases with all their functions goes beyond the scope of this dissertation, I will only focus on some of the basic functions of some cases (i.e. nominative, genitive and locative). Having looked at the acquisition of case in Polish monolingual children, in the next section I summarise previous findings on Polish heritage speakers' acquisition of case.

3.5 Previous research on Polish heritage speakers acquisition of case

Though very scarce, previous research of spontaneous speech of Polish heritage children proposed that nominative, accusative and genitive replace dative, locative and instrumental in heritage children's grammars (Laskowski, 2009). Previous studies also explained most of the changes in child heritage speakers' grammar in terms of cross-linguistic influence from a majority language (in the case of Laskowski's study, Swedish). Laskowski (2009: 178, 197) emphasizes that most of the instances of replacements of the locative with nominative appear with proper names or irregular nouns which according to him suggests that "these errors result from difficulties in the choice of the correct ending rather than incomplete acquisition of the locative" and that "the strong position of possessive genitive is reinforced by Swedish genitive". This study is missing a full picture of the heritage speaker children because it disregards any heritage speaker children who display a perfect or almost perfect mastery of the category of case. It is important to include their idiolects as well because it is then possible to observe what is different between different level speakers and what factors may be influencing their HL and contributing to 100% accuracy. Laskowski (2009) concluded that genitive and locative have not been perfectly mastered. However, with regards to genitive later Laskowski (2009) mentions that because heritage children use genitive (aside from nominative and accusative) to replace other cases they know them best. This is somehow contradictory. Laskowski (2009: 178) states that because heritage children in his study replace the locative with accusative and genitive, this seems to be a "transitional phase of case-system acquisition when the locative function has already been acquired by child, but the means for expressing it have not yet been sufficiently mastered". He explains that the "mechanism behind this substitution is trivially simple: the yet not (sufficiently) learned cases are replaced by the already acquired ones". With regards to genitive, Laskowski (2009) observed that heritage speaker children would struggle with its abundant functions, however he also observed that one child replaced it with a nominative case in its possessive function. He concluded that this child was a striking exception and that he also inverted the word order with regards to this genitive (in its possessive function) and followed the Swedish word order placing it immediately before the head noun. Laskowski (2009: 136) also reported that the dominant language heavily affects the case system hampering the acquisition of the other, but the acquisition is still subject to the internal rules of that language. What is more, Laskowski (2009) states that heritage children in his study behave in the same way as monolingual children (Smoczyńska, 1985) with respect to mixing locative and accusative prepositional phrases with spatial function (expressing place – for locative and direction for accusative).

As Janssen (2016: 63) argues “it is clear that bilingual children have greater difficulty with case endings in Polish than monolingual children” and “this seems to be especially challenging for children who acquire Polish in combination with a language that does not have a case system”. Janssen (2016) conducted a study on the acquisition of gender and case in Polish and Russian heritage speaker children (with two typologically closely related Slavic languages) aged 3-6 with Dutch as the dominant language. In this study, Janssen’s (2016) main goal was to establish how the acquisition of gender and case differ between Polish and Russian in monolingual children in Poland and Russia, and bilingual Polish-Dutch and Russian-Dutch children growing up in Netherlands. The results of the study showed that gender production was more difficult in Russian than in Polish, however as far as case comprehension is concerned, this was no longer as clear to establish (Janssen, 2016). Nevertheless, a general advantage of Polish over Russian was observed in this study concluding that Russian children were slower in the acquisition of gender and case. Most importantly, Janssen (2016) also confirmed that with regards to cases bilingual children made different types of errors to the monolingual children, who would provide an ending from another oblique case whilst the former group would not change the endings but they would simply use nominative form in place of another case form. Furthermore, Janssen (2016) also established that Dutch being no case marking language could have contributed to the results via negative transfer.

Beyond Laskowski (2009) and Janssen (2016), research on heritage Polish case has focused on adult speakers. Koźmińska (2015) demonstrated in her study of Polish heritage college students in the US that heritage Polish undergoes reduction in nominal morphology. She argues that their adult heritage Polish (their natural speech meaning it differed from a speaker to speaker in terms of tokens in production) undergoes restructuring that leads to a decrease in the number of cases, and, in its final stage becomes a two-case system with the nominative case and one oblique case. She suggests that Polish is incompletely acquired for these speakers, and that changes between the heritage Polish of these speakers and standard Polish result for the most part from the interference from English, as the majority language, into heritage Polish although she concluded that more research is required in this area to confirm the extent of these changes. In the example 22 and 23 below, nominative is used instead of genitive. In monolingual Polish the object after the preposition (to) should be in the genitive (Koźmińska, 2015) but the speaker used nominative case (unmarked case). Similarly, instrumental case was replaced by nominative and locative was replaced by genitive.

Heritage Polish:

(22) *Jeździ-li-śmy*	*do* ***Częstochow-a***	*i*	*tak-ie*
go-MASC-PAST-1.PL	to **Częstochowa-NOM**	and	such-FEM-PL-NOM
rożn-e	*miast-a*.		
various-PL-NOM	city-PL-NOM		

"We went to Częstochowa and other various cities."

Monolingual Polish:

(23) Jeździ-li-śmy	do Częstochow-y	i	tak-ich
Go-MASC-PAST-1.PL	to Częstochowa-GEN	and	such-FEM-PL-GEN
rożn-ych	miast		
various-FEM-PL-GEN	*city-PL-GEN*		

"We went to Częstochowa and other various cities."

Koźmińska (2015: 255) argues that "lexical innovations are modelled on English" which according to her may be the result of the lack of schooling. Koźmińska (2015: 256) also explains that "this study shows that the Polish of heritage Polish speakers in Chicago has become fossilized after rich input in the language was reduced". These findings support what was established by Laskowski (2009). Koźmińska (2015: 256) concludes that "most differences between heritage Polish and standard Polish are caused by high exposure to English and insufficient input in Polish, which leads to language transfer from the host language into the HL". However, Koźmińska (2015) emphasizes that more studies are needed to establish what factors affect the language of heritage speakers. In her case study, Barski (2017) examined the HL of a one adult Polish heritage speaker in Canada who completed one production task. Findings of this study revealed a significant language loss and a full restructuring of nominal case inflection in Polish, i.e. the six-case system has been restructured to three cases with two being fully productive.

In a recent study, Wolski-Moskoff (2019) investigated the use and knowledge of case by adult Polish heritage speakers in the USA. Her results show that all oblique cases (other than nominative, accusative and vocative case) are preserved in the speech of advanced heritage speakers, albeit occurring less frequently than in the language of first-generation immigrants and a monolingual control group from Poland. She found that the lower proficiency speakers' show the lowest accuracy and suggested that the grammatical systems of these speakers operate by the syntactic rules of the dominant language (i.e. English). In this study, the lowest proficiency speakers used nominative most often to replace cases and the more advanced adult heritage speakers used nominative and accusative to replace other cases. What is more, they often replaced cases in post-prepositional functions with accusative for locative and locative for accusative. As Wolski-Moskoff (2019) looked into the entire case system in Polish,

she also found that lower proficiency speakers did not know all the functions of genitive, and dative was lost. Wolski-Moskoff (2019) explained that differences in performance of the heritage adult speakers resulted from an activation for production – the more often the heritage speakers used the heritage language, the better they performed in their HL. Wolski-Moskoff (2019) states that English-dominant heritage speakers in her study activate their HL with varied frequency and that this is also reflected in their varied proficiency. What is more, Wolski-Moskoff (2019: 229-230) concludes that "with greater exposure to English than HL, not only may heritage speakers replace the semantic and phonological features of their HL with features from their dominant language, but also the connection between functional features and the other two types of features may lessen. These processes can lead to problems with lexical retrieval as well as retrieval of morphological elements such as affixes associated with it." There were some heritage speakers in her study who replaced locative with nominative and Wolski-Moskoff (2019) concluded that this was the proof that they were lacking cases in Polish and possibly never acquired the Polish case system. Although Wolski-Moskoff (2019) explains the results of the heritage speakers in her study in terms of the activation for production model, she also draws attention to the fact that input may play a more substantial role than the authors of the activation for production model are prepared to admit. Additionally, her results of the first-generation immigrants indicate that the frequency of oblique case use is much lower than in the language of the control group and point to the divergence of the parental input. Wolski-Moskoff (2016: 202) did not observe any problems with either nominative or genitive case (in its possessive function), however, she concluded that locative was the most difficult as far as endings were concerned: a replacement of locative-accusative and reduction of allomorphy. She also pointed out that locative and accusative share various prepositions, however, as she rightly points out those prepositions denote two different concepts, i.e. when using a preposition 'na' with accusative it is meant to mark direction, whereas if it is used with locative it denotes location. Overall, Wolski-Moskoff (2019: 277) argues that heritage speakers in her study use compensatory strategies that allow them to maintain their HL rather than interpreting them as signs of language loss and that the differences between the language of the heritage speakers and monolinguals observed in her study "point to the role of bilingualism and the influence of the dominant language". On the other hand, Łyskawa and Nagy (2019) who examined case-marking variation in heritage Polish, Russian, and Ukrainian found no significant differences between homeland and heritage speakers when comparing semi-spontaneous production of 1st generation migrants and heritage speakers (2nd generation) with monolinguals in the homeland. In fact, they observed that any variation in HLs was also noticeable in homeland languages (e.g. genitive – accusative substitution). Although this study analysed the Polish case system from a variationist perspective, it showed that there is some variation in the

speakers' production (even in monolinguals) and that the heritage speakers show a consistent pattern of variation, which is language-internal (and not an outcome of incomplete acquisition).

The above studies focused on the Polish adult heritage speakers in the USA or, as in Laskowski's case, on Polish children studied in the early 1990s in Sweden. As results from a population in one setting may not be generalizable to the other setting (Benmamoun *et al*., 2013) and case marking has not been covered in the UK, it is particularly relevant to be studying Polish, considering that the Polish language is currently the second most spoken language in the UK (White, 2017). In summary, the above studies explained that changes in the heritage language resulted from a cross-linguistic influence or interference from the majority language and that the grammatical systems of heritage speakers operate by the syntactic rules of the dominant language as well as pointed to the divergence of parental input. However, as we cannot see enough about those theories from the existing work on Polish heritage speakers, investigating the language of heritage children in this study can help cast more light on the topic. Furthermore, investigating the language of child heritage speakers is key in order to fully understand adult heritage language (Polinsky, 2018a) because it can tell us if children keep certain language features or whether they have them in the first place.

From studies on other Slavic languages with similar case systems, e.g. Russian (Schwartz *et al.,* 2014), we know that heritage Russian is more difficult for the heritage Russian children whose other language does not mark gender or case. This is further confirmed in Janssen's (2016) study of Polish-Dutch and Russian-Dutch heritage speaker children. Dutch does not mark gender or case and heritage children in this study used bare nominative instead of an oblique case. As this seems to have been the most frequent error they made in this study, Janssen (2016: 245) therefore concluded that we can assume that negative transfer from non-case language affected performance in the case language. On the other hand, it can sometimes be the opposite for languages that both have case, e.g. Polish-German speakers. In their study of the production of different objects by Polish-German bilingual school-aged children, Rinke, Sopata and Flores (2019) concluded that the bilingual acquisition of object realization is guided by the relevant properties in the target language and is not influenced by the contact language, i.e. German. Further, Polinsky (2018: 197) explains that "heritage speakers tend to disregard case-marking variation and instead settle on one or two forms as the default for nouns" and what is more, "the choice of the default form interacts with the frequency of case forms in the input" with "the overall tendency to push toward eliminating case distinctions in the nominal domain". This is also confirmed by Montrul (2016: 61) who outlines that "in general some forms tend to be omitted and the case system is simplified". Polinsky (2008a) investigated the heritage language of two Russian heritage speakers living in the United States aged 9 and 23 using Meyer's *Frog Story* narrative. The results showed a simplified case system as compared to the baseline in

Russia, i.e. both participants used nominative case as both subject and object and they used accusative case to mark dative case. What is more, they also used nominative with prepositional phrases unlike the controls in this study. It is worth noting that both of them stopped using Russian actively when they started school. In another study of Russian heritage speakers, Isurin & Ivanova-Sullivan (2008) also examined Russian heritage speakers however, they have not found the same results and instead dative case was used in place of accusative and genitive and instrumental instead of the prepositional. What is more, nominative was not used after prepositions as in Polinsky's (2008a) study. Polinsky (2018: 198) also draws attention to the influence of English (if it plays the role of a dominant language in a given HL context) pointing to its "shallow morphology which may play a role". However, Polinsky (2018: 198) also points out that even the languages which have some case morphology lead to errors which means that "not all instances of this vulnerability can be attributed to transfer from the dominant language". Polinsky (2018: 198) mentions that this may also be a result of the tendency toward uniformity and simplicity, because it is arguably easier to retrieve a single lexical item from the lexicon than to assign case marking in different contexts.

To sum up, previous research shows some cross-linguistic influence from the dominant language on the Polish heritage language (e.g. Laskowski, 2009; Koźmińska, 2015), i.e. that changes in the heritage language resulted from a cross-linguistic influence or interference from the majority language and that the grammatical systems of heritage speakers operate by the syntactic rules of the dominant language, whilst on the other hand some studies point to no influence by the contact language (e.g. Rinke, Sopata & Flores, 2019) or some variation which is language-internal that is also observable in the homeland (e.g. Łyskawa & Nagy, 2019).

3.6 Summary

In this chapter, I have reviewed the previous research on Polish heritage speakers' acquisition of case having first defined case and described more generally case in Polish and case in English. I have also presented a summary of research on the acquisition of case in Polish monolingual children as well as the previous research on Polish heritage speakers' acquisition of case. Apart from the possibility of changes to linguistic properties stemming from the issues discussed above, change in the social environment should also be investigated as potentially significant in the lives of Polish heritage children starting school in the UK as this impacts on the possibility of changes to linguistic properties. In the following chapter, I explain the sociolinguistic context and the change in the social environment for these children.

Chapter 4 Starting school and the importance of the sociolinguistic context

4.1 Introduction

In this chapter, I explain the importance of sociolinguistic context for heritage language acquisition. The aim of this chapter is to demonstrate how starting school entails a significant change in input and social networks for a child heritage speaker. The chapter is structured as follows: in Section 4.2, I introduce what changes in the input are for child heritage speakers. In section 4.3, I outline the sociocultural context of Polish in the UK. In Section 4.4, I explain changes in the social networks when child heritage speakers start school in a majority language including studies that examine the role of social factors in HLA and finally, in Section 4.5 I provide a summary of the sociolinguistic context.

4.2 Changes in the input

The start of school (at the age of 4 in the UK) is a significant social upheaval for any child. Similarly to any child, when child heritage speakers first learn their language, they acquire the grammar of their L1 based on the input they receive in the early years and this input is provided by the parents and/or primary carers. However, when they start school, they enter an entirely new linguistic and social world. Child heritage speakers experience a change in the amount of input, i.e. a substantial shift in terms of increased exposure to the majority language and reduced exposure to the heritage language. This is both in terms of quantity (i.e. they usually spend more time hearing the majority language and the opportunities to use their heritage language become limited or they use their minority language mainly with family members) and quality (i.e. limited literacy in the minority language usually means that they are more familiar with everyday register as opposed to for example written language). The amount of input in the L1 begins to vary contextually and structurally (Montrul, 2016). Usually, the majority language becomes the primary and minority language becomes secondary. On one hand, the significantly diminishing amount of interactions in the heritage language at that time may disturb further development of this language, but equally for others HL input may continue to be diverse and regular.

The children in this study have grown up in Polish families in which both parents speak Polish and starting school thus comes with a significant change in input and their social network. Around the age of 4, once they start schooling in the majority language (which in this case is

English), they become increasingly exposed to it. They get a change in the input as they start school in the majority language (which in this case is English) and they get a change in input in their language (Polish). The two languages (Polish and English) now find themselves in competition, making this change even more pronounced. These speakers switch from a home language environment (where interactional networks consist primarily of family to a school environment. When these Polish child heritage speakers go to school in the majority language setting, parents and siblings, or friends are no longer in the fore and although they are still a part of this minority community, they start having friends of their own in a completely new environment with a language that so far most of them had fairly limited contact with (Haman *et al*., 2017), however, the children may still have quite a few Polish friends in school. They spend most of their day hearing the majority language and this exposure increases even more if they attend after-school clubs and activities run in the majority language. There is less time for the minority language to be used or heard for the children in my study. Heritage speakers often start speaking more and more in the majority language to their parents and their knowledge of minority language becomes more receptive with less production (Polinsky, 2018). Some parents may even try to start speaking in the majority language to their children as they want to make sure that when they start school, they will be able to communicate in that language (Romanowski, 2021).

Additionally, what other studies point to (e.g. Kerswill, 1996) is that family on its own is not sufficient for the language to continue developing and although its role is still significant after children start school, they need other sources of input for the heritage language to develop such as their peer groups and society at large (Polinsky & Scontras, 2020). What is more, it has been observed that the variability of these sources of input can be immensely beneficial for successful language acquisition in general (Embick *et al*., 2020; Valian, 2020). There is an interesting observation made by Serratrice (2020: 47) who explains that “unlike monolingual children, who have no choice but to use their one language, child heritage speakers do have a choice. The way in which they exercise that choice has interesting implications, both for heritage language maintenance, and for better understanding how children’s agency in their language use affects their linguistic development”. The start of school for heritage language speakers marks a point in time from which they will be identifying with their heritage language in various ways at different times and what will follow from this is their language choices and how they relate to various people in their lives and that these choices will be conditioned “by the bilingual learners’ motivation to use the languages, social networks, and opportunities to use the languages” (Montrul & Polinsky (2019: 431). What is more, as Montrul and Polinsky (2019: 431) further explain “a move away from the heritage language and culture toward the majority

language and culture is common once children start schooling and their main peer group consists of other children".

Taking into consideration that social networks also constitute a source of input and that it is possible to deduce the amount of input in Polish and English from the friendships in school, it is important to include these when trying to demonstrate how changes in input and exposure to the majority language affect heritage language acquisition in the first year of school (Reception in the UK school system). Before I describe the role of social networks in more detail, it is important to contextualise the Polish community in the UK.

4.3 Sociocultural context of Polish in the UK

In the previous section, I emphasised how in the early years the family is the primary source of linguistic input for child heritage speakers and so it is for Polish heritage speakers. First, I will provide some characteristics of the Polish community in the UK. Then I will describe the community that the Polish heritage children are entering into when they start school. Specifically, I am conducting this study in the context of Southampton, a port city in the south of England with a population of just over 260k inhabitants (ONS Census, 2021), and so I will focus on Polish child heritage speakers starting school in this particular area.

The Polish community is currently the largest ethnic minority in the UK estimated at over one million Polish people (ONS, 2021). This community originally tended to settle in London, but for many years now it has been common for Polish people to settle in other towns in the UK, including Southampton. With such an extensive Polish community in the UK (White, 2017) and with 4.7% of the population in Southampton consisting of Polish people (ONS, 2021), we can expect the prevalence of bilingualism in school settings. In Southampton, data from the Spring 2023 school census looking at the languages spoken by pupils show that whilst English is ranked as first in all wards in terms of number of speakers, Polish is ranked second highest in Southampton with 8.1% (2,626) of all pupils (Southampton Strategic Assessment, 2024). Young (2018: 103) in her study of Polish-born adolescents living in the UK explains how "it has been argued that such bilingualism is not always permitted to students within a school setting, but that actual linguistic practices often differ from the official policy" and following Bourne (2001: 103) "bilingualism is part of school life and part of school learning whether that is officially accepted or not". Currently, the Polish community is less socially-homogenous. In the past it consisted of unskilled workers whereas it now commonly includes those holding academic degrees, both young and old with various proficiency levels in English. White (2017) explains that "Poles arriving in the UK often do not have definite plans as to how long they will stay and whether or not they will return". In their study, Eade *et al.*, (2007) found that "the least

permanent of the migrant groups tended to develop dense Polish social networks". At the same time, there will also be a lot of young Poles who want to assimilate in the UK and who might want the same for their children, hence they might be putting more pressure on the acquisition of the majority language on their heritage children.

Naturally, with such a large community presence, in many towns and cities in the UK, there is a noticeable Polish infrastructure such as local shops, clubs, medical centres, churches, radio and Polish heritage schools (Seretny & Lipińska 2016). This is the case in Southampton: for example, there is one Polish heritage school, one Polish medical centre, one Polish club, a regular Polish broadcast on a local radio, regular Polish masses are held in four churches every week and there are around twenty Polish shops. With such a vast community presence, there are opportunities to use the heritage language. Further to this, more condensed social networks provide better opportunities in terms of language acquisition and maintenance (Lynch, 2003: 9) and it has been proposed that communities play a role in promoting heritage language (Wiley, 2005). Interestingly, Hill (2014:14) portays the Polish community as "fiercely defensive of L1 maintenance" perhaps due to its turbulent history when for many years and in many different partitions of Poland they were prohibited from using Polish language. On the other hand, it is also important to remember that language use may be potentially affected by the prestige of a given community and its language (i.e negative prestige towards the community and its language may cause its speakers to adverse attitudes towards their own culture and language). In this case, past representations of Polish in the media (e.g. Spigelman, 2013) were generally unfavourable (Rzepnikowska, 2019) mainly in the context of being an economic threat.

It is essential to describe what sort of a community Polish heritage children are entering into when they start school. Naturally, when they enter majority language schools we can expect an overall presence of English language. However, due to the large Polish community living in Southampton we can expect that in some of the schools there is going to be a noticeably higher number of Polish pupils, especially in catchments that are popular among Polish people. One such example could be local Catholic schools that tend to be favoured by the Polish community. This means that although probably the vast majority of schools will include a scarce number of Polish pupils, there will be some where this number will be much more notable and some of the classrooms will house a substantial number of Polish children. This sociolinguistic context is contrasting with any settings from previous years that would most likely contain a much smaller number of Polish pupils. This shows a large community which provides many opportunities to use Polish, also outside the family. Taking into account this new sociolinguistic context is important, considering that some researchers claim that HL would not be acquired in the absence of a wider speech community (Cazzoli-Goeta & Young-Scholten (2011)).

Having discussed the changes in the linguistic input and the sociolinguistic context of Polish in the UK, I now turn to explaining the role of social networks.

4.4 Social networks

The above-mentioned social change can be equated to a 'switch' that combines two important sides: a linguistic one and a sociocultural one. We can expect these two sides to be connected and influence one another. It is a time when a great change in the input takes place, but also an important adjustment/addition of social networks for the heritage speakers, as it is the case for the Polish heritage children in the UK.

In sociolinguistics, the role of social networks in language change has been thoroughly examined. Milroy describes social networks as "informal social mechanisms supporting language varieties specific to particular social groups" (2002: 549). In their seminal studies Milroy and Milroy (1980, 1987, 1992) emphasised how important the social network characteristics are for the transmission of language change. Milroy and Milroy (1992) described how a network that is close-knit will simply resist the adoption of changes and this will hold until the changes come from somebody with "weak ties", i.e. roughly ties which connect acquaintances (as opposed to "strong ties" which connect friends or kin). A few scholars reiterate how important the density and strength of these ties is (e.g. Myers-Scotton, 2006) and explain that "the social networks of heritage speakers, the density of the networks (number of interlocutors) and the degree of proficiency of the speakers in the network also contribute in important ways to the quality of input heritage speakers are exposed to" (Montrul & Polinsky, 2019: 430). What is more, as Alam (2015:16) argues "for different individuals all networks are not equally important. Even networks with low density and simpler ties can have a high value for speakers strengthened by a particular loyalty or personal reason." Cheshire *et al*. (2008) emphasize friendship networks as the motor of dialect change in their study of young people aged 16-19 in London. Kerswill and Williams (2000) found that the possibility of forming new social networks among children influences the outcome of dialect contact because as the children grow older their speech becomes more and more aligned linguistically with the speech of their peers. As an example, Kerswill and Williams (2000) mentioned how the high scorers on the fronting and unrounding of the GOAT variable (i.e. the vowel found in words of the GOAT lexical set, such as *go, load, boat, snow* etc.) socialised with a particular group of friends as opposed to the other group who socialised much less prominently and received lower scores. Similarly, the importance of friendship networks for teenage and early adults has also been found in other studies (Eckert, 2000), however this has been attested not only for this particular age group and as childhood networks have also been advocated as having pronounced impact

on speech and linguistic development (Sankoff *et al*., 1997; Vann, 1998) and Diaz-Campos (2011) confirms that immediate family and community context (including pre-school or school) are an essential part of these networks for children as young as 4. Although social networks have been widely researched amongst the adolescent groups "fitting in linguistically is important during all life stages" (Ryan, 2018: 269). The size of the community or in other words the social network structure is also deemed to be a prominent factor for language preservation and language potential in case of immigrant communities and those which are concentrated in large numbers in particular locations promote the frequency and intensity of contact amongst its members as has been demonstrated in various studies (Wei *et al*., 2000; Wei, 1994). Another study that brings attention to the crucial role that a speech community can play is by Laleko and Miroshnychenko (2022: 188) who demonstrate that "while high degree of social entrenchment contributes to the preservation of morphosyntactic complexity in a heritage language, it does not entirely prevent grammatical restructuring or categorically reshape its underlying mechanisms". The results of this study concluded that case marking in young adult heritage Russian English speakers has undergone the most significant reorganisation characterised by default use of the nominative and strengthening of the more functionally central cases (such as accusative and genitive) at the expense of obliques (Laleko and Miroshnychenko, 2022).

Considering that the social networks and the interactions between members within them are indeed a driving force behind language change and that the adoption of the features by a speaker would depend on their network characteristics, they should not be ignored in the case of heritage speakers. The role of social factors in heritage language, (e.g. ethnic identity) has been increasingly given more attention (e.g. Armon-Lotem *et al*., 2014) and has been found to be important with extralinguistic factors deemed as predictive of the bilinguals' performance (e.g. Schmid & Karayayla, 2019). Adding more of these studies from different communities can further determine heritage speakers' linguistic abilities (Chondrogianni & Daskalaki, 2023) and enhance the existing knowledge regarding these factors.

As an example, Rodina *et al.* (2020) in their study of gender in Russian child heritage speakers looked at the importance of the size of a heritage language speaking community, and more specifically at the size of the Russian-speaking community in five different countries such as Germany, Israel, Norway, Latvia and the United Kingdom. As Rodina *et al*. (2020) emphasize, the size of these communities differs in each of these countries and is, for example, considerably larger in Latvia than it is in Norway with much smaller Russian-speaking groups. This study found that the size of the heritage Russian community correlated positively with the children's accuracy and indicated that "children from communities with a higher proportion of Russian speakers performed better than children from communities with a lower percentage of Russian speakers (Rodina *et al*. 2020: 10). Similarly, van Osch (2019) found that the Hispanic heritage

speaker communities in the Netherlands are smaller and more dispersed, which may lead to fewer possibilities for interaction with other speakers, and thus a smaller advantage on the oral production task.

In another study, Chondrogianni and Daskalaki (2023) used a picture-naming task targeting HL vocabulary and an elicitation task targeting syntax- and discourse-conditioned subject placement in Greek-English-speaking bilingual children of Greek heritage residing in Western Canada and New York City, and emphasized the importance of having opportunities to speak to a variety of speakers in different contexts which would be possible during the short visitis to and from homeland. This meant they were able to speak to a variety of interlocutors allowing for diversity of and exposure to a variety spoken by more speakers and in different contexts for HL maintenance. Kubota and Rothman (2025) similarly emphasized the importance of early immersion experiences during holidays that allow heritage bilingual families to broaden their social networks.

In another study, Torregrossa, Flores and Rinke (2023) who tested 180 children between the ages of 8 and 16, living in Switzerland and speaking European Portugese as HL and French, German or Italian as their societal language found that the variety of language exposure affects HL acquisition positively. This means that they speak EP not only to their parents but also to a number of different speakers due to EP's presence in the wider community of Portugese migrants. Equally, Correia, Lobo and Flores (2024) in their study of 25 bilingual heritage speakers of EP with German as societal language (aged 6 to 10) evaluating their knowledge of various syntactic properties, found that richness of the HL input emerged as a significant predictor of the bilingual children's accuracy. This means that heritage speakers who are exposed to more diverse HL input (including EP-speaking friends) perform better than those whose language exposure comes from fewer sources of HL input (Correia, Lobo & Flores, 2024).

From the above studies, it transpires that it is important to consider social factors such as the amount of time that speakers spend with interlocutors, the contexts in which they talk and hear language as well as how many opportunities they have to exercise their communicative skills (Shatz, 2009) as they all affect language development in children (Hoff, 2006). Corbet (2022: 6) makes an important observation that "a large number of hypotheses and models of heritage language acquisition invoke sociolinguistic and psycholinguistic variables as having key explanatory role in the grammatical outcomes observed in heritage speaker populations". Considering that 4.7% of the population in Southampton consists of Polish people, social networks may constitute an important variable in school settings where bilingualism is a part of school life whether it is formally recognised in such environments or not. In her, study, Young (2018) describes how some of the young Polish adolescents feel isolated when they cannot

speak much of the majority language and that when they find someone else who speaks the minority language they feel like they belong and they do not feel as isolated and alone. One of the fundamental factors contributing to a sense of belonging is friendship for both adolescents and young children (Davis, 2012; Faircloth & Hamm, 2005; Hamm & Faircloth, 2005). Following Hamm and Faircloth (2005: 62), "friendship may play an important role in meeting the emotional aspect of school belonging, in support of or as a buffer to experiences of inclusion and exclusion derived from peer group acceptance". Having friends and feeling socially connected for children is how they can develop sense of belonging at school. Theobald (2017: 4) presents international investigations of how children and young people make friends in bilingual settings and illustrates that friendship is highly valued in such environments hence children pay attention to what is important to be included in friendship groups, but most importantly how language is used to represent a stance (be it of opposition or alignment) and that "even when a *lingua franca* has been established, social order, understanding, and relationships cannot be taken for granted and are constantly in flux". Theobald (2017) also explains how making friends usually involves having something in common (and language is surely a part of this) and how friendships are especially valued when children face change such as starting a new school. We can expect that the young children starting school in the majority language who also cannot speak much of the majority language will experience similar feelings as in the above studies and that being able to speak to someone else who speaks Polish might promote their feeling of belonging, especially if there is a group of other Polish child heritage speakers experiencing the same. Some studies on social networks (e.g. Ryan, 2018) pointed to the friendship networks as an explanation for individual language differences in heritage speakers' acquisition of the majority language. We can expect that heritage children who begin school will be reorganising or expanding their social networks – they may still include family and relatives albeit in a different way. When heritage children start school they may include new acquaintances in their social circles depending on their social lives at school or in the individual classrooms. It is possible that when presented with an opportunity in the classroom to develop either Polish or English friendships, some Polish heritage children will choose Polish friends and some will decide to be friends with English children or indeed, other nationalities. These friendships will depend on the composition of individual classrooms, i.e. actual ratio of Polish children in a given class. In this study, I want to investigate what kind of effects (if any) friendship groups are going to have on the production of cases in Polish. The composition of the Polish heritage children's social networks may look differently at the beginning of the year to the arrangement of their social networks at the end of the school year as children possibly gain more confidence with English or indeed, some will start off very confident in English. Hence, it will be crucial to examine if this plausible change in the friendship network composition may be in any way consequential to their Polish

language. This is linked with the amount of input in Polish and English which can be deduced from their friendships in school.

4.5 Summary

To sum up, first year in school gives an opportunity to observe what happens in a situation of reduced heritage language input in child heritage language acquisition. It also allows us to see what happens to a grammatical feature under pressure from another language at that point, but also a chance to observe whether sociocultural factors affect any change in the grammar. Specifically, the change in the environment when these children go to school gives us an opportunity to observe how/if social networks influence possible changes to a heritage speaker's grammar. Thus, I propose the following prediction as a result: I predict that those Polish heritage children who have more Polish networks (Polish friends) at school would show more correct use of cases, whereas those Polish heritage children who have more English networks (English friends) would show more incorrect case use and more reductions in case marking, which will support the input/exposure as an influential factor in heritage language development. Hence, I also investigate the social environment as potentially significant in the lives of Polish heritage children starting school in the UK based on the above findings relating to the social networks and friendships more broadly and in the school environment.

Chapter 5 The current study

5.1 Introduction

This section outlines the research methods implemented in this study and is organised as follows: first, research questions and predictions will be presented in Sections 5.2 and 5.3 which are followed by a thorough description of the participants recruited as part of this study and a discussion of the appropriate demographic data for all the groups in Section 5.4. Subsequently, a detailed description of data collection methods used is provided starting with the experimental tasks in Section 5.5. Finally, the procedure for the administration of the experimental tasks employed in this study is presented in Section 5.6 as well as a procedure regarding the data analysis from all of the tasks in Section 5.7 and a summary in Section 5.8.

In accordance with applicable policies regarding ethical considerations of working with children and adults, I gained an ethical approval from the University of Southampton Faculty of Arts and Humanities Ethics Committee (Ethics number: 66550) which is evidenced in Appendix A.

5.2 Research questions

Following on from the discussion as put forward in the literature review chapters, the research questions addressed in this study are as follows:

Overarching research question: how do changes in input and exposure to the majority language affect heritage language acquisition in the first year of school?

RQ 1) To what extent is there evidence of incomplete acquisition of case among these heritage children in the first year of schooling?

a) Does this vary across the three grammatical cases investigated (i.e. Nom, Gen poss, Loc)?
b) Is this consistent across tasks?

RQ 2) Does attrition occur during these heritage children's first year of schooling?

a) Does this vary across the three grammatical cases investigated (i.e. Nom, Gen Poss, Loc)?
b) Is this consistent across tasks?

RQ 3) To what extent is any increase or decrease in accuracy over first year of schooling explained by language input and social networks?

By finding out the answers to these questions new insights on heritage children and the influence of schooling in the majority language will be achieved advancing our knowledge of how complex HLA is and how it can be understood if we take into account various factors both linguistic and sociocultural.

Next, I present the main predictions put forward in this study.

5.3 Predictions

Having laid out the three accounts that are used as explanations for the effects in heritage speakers: incomplete acquisition, attrition and parental input effects, these are the predictions that these three theories make.

Regarding the first account the prediction is that if the heritage children show reduced accuracy in task performance as compared to monolingual children in Poland at the beginning of the school year (Time 1), then this could mean that the case acquisition is ongoing – delayed. There are two factors that can affect whether Polish heritage children will use the correct forms of Polish cases. One of them is the timing of acquisition and the other one is the structural complexity. With regards to the nominative, I predict that the heritage Polish children will not have any difficulties as this case is used very frequently in Polish and previous studies have defined this case as stable (e.g. Laskowski, 2009). This prediction is further enhanced considering the timeline of acquisition of nominative for monolingual children and its very early mastery (before the age of 2) (Smoczyńska, 1985), hence, the Polish child heritage speakers would have most likely acquired the nominative by the age of 4, i.e. by the time they start school in the UK. This case is also the most frequent in the input these children would have received in Polish. With regards to the genitive, similarly to the nominative, it is mastered very early by Polish monolingual children (Smoczyńska, 1985), hence no difficulties are anticipated for this form at the start of their first year in school and Polish heritage children would likely have acquired it by the time they start school in the UK. Although possibly less salient than the nominative, the form would still be abundant enough in their input. With regards to locative, it is a lexical case (as opposed to nominative which is a structural case) and it is assigned by specific prepositions as indicated in Chapter 3. The locative seems to appear slightly further down the monolingual timeline of acquisition i.e. after the age of two and a half and it is also less frequent in their speech (Smoczyńska, 1985; Łuczyński, 2004), hence, it is possible that it may be less frequent in the speech of the Polish heritage children in comparison to nominative and genitive and that some child heritage speakers may not have acquired it by the time they start school in the UK. It is also a case that requires a higher number of phonological alternations which are more difficult to acquire (Łuczyński, 2004). Previous studies in the

acquisition of German (e.g. Eisenbeiss *et al*., 2009) and Russian (e.g. Babyonyshev, 1993) showed that lexical case marking is developmentally delayed and more error prone than structural case marking. This shows that lexical case is the more complex case which involves different knowledge than the structural case. It is possible that some Polish heritage children need more time and more input for this structure to be fixed.

Regarding the second account the prediction is that if heritage Polish children in the UK perform the tasks with high accuracy at the beginning of the school year (start of the Reception – Time 1), but then at the end of the school year (Time 2) show changes in their task performance, then these changes could be a sign of the onset of attrition. One of the factors that could affect whether the Polish heritage children use correct forms of Polish cases is exposure to English which could be especially prominent at the end of their school year when they had a chance to be exposed to an extensive amount of input from English. I will thus compare how each of the cases may be influenced by exposure to English.

Firstly, regarding the nominative. This is a structural case in generative grammar, which marks the subject. The [uCase] feature on the noun is valued as nominative in relation to T in both English and Polish. In Polish there is a morpho-phonological expression of this case (which also contains information about number and gender due to the extensive case syncretism in the language, see Section 3.3.1.1). In English, there is no morpho-phonological expression of nominative case; instead, case is tied to the syntactic position in which the subject ends up. As a result of this distinction, word order in Polish is quite flexible, whereas word order in English is much more fixed (see chapter 3, examples 1-3). With regards to the nominative case, then, in English the underlying case feature is valued the same as Polish, but there is no morphological expression on the surface. The learning task for a Polish child heritage speaker immersed in English thus entails mapping the same case feature onto a new form or lexical item where case feature is the same, but unexpressed morpho-phonologically in English. I predict that the heritage Polish children will not have any difficulties as between languages.

As far as the genitive case is concerned, the [uCase] feature on the possessor in the specifier of the DP in both languages is valued as [Gen] by the D head. Both languages have a morphophonological spell out of this genitive feature (‘*s* in English and various forms in Polish), though in English it is a head and in Polish a suffix. This means that the genitive is overtly marked on English nouns and it is marked in Polish[5] so the mechanisms for genitive case marking look very similar (i.e. the feature valuation is the same and is expressed morphologically in both

[5] In Polish, apart from the possessive function, genitive has other functions such as: adnominal, subject & direct object after negation, patient and partitive. In this study I focus purely on the possessive function of the genitive.

languages, although the exact expression is different (24)). The learning task thus involves simply mapping the same case feature onto a new form. I predict that this may facilitate maintenance of genitive in Polish in its possessive function.

(24) Polish książk-a An-i

book.NOM Anna.GEN

(25) English: Anna's book

Anna.GEN book.NOM

Regarding the locative, it is only assigned by specific prepositions such as na (on), przy (by), w (in), po (after), o (about, at), rather than by the functional P head as in English. In Polish it is assigned lexically rather than structurally as in English.

(26) Polish na książ-ce English on the book

on-PREP book-LOC

As previously mentioned, in Polish locative case is assigned lexically by specific prepositions. In English, it is a complement to the functional P head and so it is assigned structurally. The assignment of this case between the two languages is different as it is coming from the functional head in English whereas in Polish it comes from the lexical item. The fact that there is assignment by a preposition in Polish is superficially similar to English which might assist; however, it is a different case and a different method of case assignment between the two languages.

Regarding the third account, the prediction is that if no changes in particular cases can be observed in the parents' native language when compared to a group of monolingual Polish adults in Poland, but the heritage children show reduced accuracy in task performance in Time 1, then parental input effects are less likely to be a factor. I predict that parents are very unlikely to have any problems with either of the cases discussed above.

Finally, I also investigate the social environment as potentially significant in the grammars of heritage Polish children starting school in the UK. Polish heritage language friendships

constitute another source of input and another source of exposure to the heritage language; therefore, they may turn out to play an important role in the heritage language development. I predict that those heritage Polish children who have more Polish networks (Polish friends) at school would show more correct use of cases, whereas those heritage Polish children who have more English networks (English friends) would show more incorrect case use and more reductions in case marking, which will support the input/exposure as an influential factor in heritage language development.

In the following section, I present the participants featured in this study.

5.4 Participants

Participants include an experimental group as well as control groups. The experimental group in this study consists of 30 Polish heritage children living in Southampton, UK. Recruitment of 30 participants in most of the groups was dictated by the fact that this is a common practice in similar studies (e.g. Wolski-Moskoff, 2019). The choice of the control groups was determined by the research questions guiding this study. There are two control groups (Pascual y Cabo, 2013). The first group includes both children and adult monolingual speakers (Polish monolingual speakers in Poland). Polish monolingual children in this group are representative of how native speakers of Polish acquired the grammatical features at the age that is being tested in this study (4 – 5 years). Comparing the heritage speakers will allow us to test if their heritage Polish diverges from L1 control grammars. Polish monolingual adults are representative of how the grammatical features are used in native Polish language. Comparing the heritage parents to Polish monolingual adults will allow us to test if their native Polish diverges from L1 control grammars which is vital for testing the parental input effects. The second group includes the parents of the heritage children (Polish adults living in the UK) to help understand what the children's acquisitional target actually is rather than only comparing with children acquiring the L1 from L1 speakers in the L1 environment. The choice of two control groups is based on previous studies showing that in some contexts parents' language has undergone changes (Montrul & Sanchez-Walker, 2013; Otheguy & Zentella, 2012; see though Łyskawa & Nagy, 2019; Daskalaki *et. al*, 2020; Coskun-Kunduz & Montrul, 2022 for no attrition in adult migrants) and on an assumption that the baseline for a heritage speaker is the language that they are exposed to as a child (Polinsky & Kagan, 2007).

Altogether I recruited 130 participants for this study: Polish heritage children (n=30) as part of the experimental group as well as parents of the heritage children (n=30), Polish monolingual children (n=30) with Polish monolingual adults (n=20) as part of the native Polish control group and English monolingual children (n=20) as a native English control group. Before I discuss each

group in more detail, I present some basic demographics in the Table 4 below. This table also contains information on which participants take part in Time 1 and/or Time 2 of the study (some of the participants are tested twice (at Time 1 and Time 2) and also third time at Time 3 which I explain in more detail in Section 5.5 regarding the methodological design).

Table 4 Basic demographics regarding the participants and their participation in the study

	Male	*Female*	*Average age at Time 1*	*Time 1*	*Time 2*
Polish heritage children	16	14	44	✓	✓
Polish monolingual children	14	16	4.5	✓	N/A
Polish heritage parents	0	30	33	✓	N/A
Polish monolingual adults	5	15	32	✓	N/A
English monolingual children	9	11	4.5	✓	N/A

Below, first I introduce the experimental group in this study.

5.4.1 Polish heritage children

In this study, Polish heritage children are the experimental group and they are speakers of L1 Polish who started primary school in the UK (Reception class – aged 4-5) in September 2021. I recruited this group through local contacts from amongst the large Polish-speaking population of Southampton area in Hampshire where it is estimated that 4.7% of its inhabitants are Polish (ONS, 2021). I advertised the study via newsletters at local primary schools and Polish Saturday schools. Overall, there were 30 participants in this group which included 14 girls and 16 boys. All of the Polish heritage children were born and raised in the United Kingdom and all of them had two Polish parents, which is a characteristic common to this group of individuals. Age of participants at the time of the experiment ranged from 4.0 to 5.0 with an average age of 4 years 4 months. More than half of the children (17) have siblings, whereas the remaining 13 are the only children. Out of the 17 children with siblings, only a third (6) are the oldest in the family. When looking at the mother's education level, it is apparent that most of them (19) hold a university degree, whilst the remaining 11 mothers graduated from colleges[6]. As mother's education level

[6] College here refers to secondary education and not to university as it may be the case in some other countries.

is commonly used as an indication of socio-economic status (SES) (Hoff & Ribot, 2015), similarly, it was used for this group of children to describe their SES status. Whilst the prevailing number of mothers are well-educated (63%), the remaining 37% of them represent a lower SES group.

These participants are representative of the whole Polish heritage population with respect to gender (males and females). The heritage children in this study do not vary with respect to family background (all of the participating children have two Polish parents). This means that they have been exposed to Polish input only at home from birth. Also, all of the children are sequential bilinguals, i.e. they have not been learning Polish and English simultaneously from birth, but instead grew up acquiring and using Polish as their first language and are now learning English at school. It is worth noticing that according to the usual scenario (Benmamoun *et al.*, 2013), heritage speaker children would be exposed to the heritage language at home until the age of 4-5 and the majority language once they start pre-school (between ages 2.5 and 3 or earlier); however, this particular group were affected by the Covid-19 pandemic and their pre-school education seems to have been largely interrupted. Whilst some of pre-schools remained opened as opposed to schools in lockdowns, most of the heritage parents in this study kept their children at home despite this fact. This may have impacted on their exposure to L2 limiting it broadly in the year before starting school, but at the same time increased their exposure to L1. The impact of the pandemic on pre-school education more generally is reported as being twofold. Ofsted (2021) found from their research interviews with early years providers that pandemic negatively impacted children in terms of their social development as well as their language and communication skills. They reported that pre-school teachers noticed that children were not as strong as those they had cared for in the past and found that some children had limited vocabulary when starting in childcare (Ofsted, 2021). Similarly, Davies *et al*. (2021) who specifically researched language growth in preschool children affected by the pandemic, confirmed that children who attended pre-school had wider vocabulary than those who stayed at home. On the other hand, Kartushina *et al*. (2022) reported that children gained more words than expected (based on normative data) during lockdown and that either caregivers were more aware of their child's development or vocabulary development benefited from intense caregiver-child interaction during lockdown. This means that children in this study may have had a different level of contact with their heritage language than the pre-pandemic generations of Polish child heritage speakers before them.

In the next section, I introduce the control groups in this study.

5.4.2 Control groups

To reiterate, the control groups include: 30 Polish monolingual children and 20 Polish monolingual adults, 20 English monolingual children and 30 Polish parents of the Polish heritage children.

In this study, Polish heritage parents are speakers of L1 Polish who settled in the UK. Overall, there are 30 participants in this group and all of them are females, hence these participants are not representative of the whole Polish heritage population with respect to gender (no male caregivers were analysed due to practical reasons). All of the Polish heritage parents were born and raised in Poland to both Polish parents. Age of participants at the time of the experiment ranged from 30 to 41 with an average age of 33 at the time of the experiment. The mean average number of years lived in the UK reported by the Polish heritage parents is 10 ranging from 7 to 13. All participants in this group speak standard Polish and they are literate in this language. They come from various counties in Poland, but there are no relevant morphosyntactic differences in their speech that would be valid for this study. Participants range in education level from further education (college) to university graduates. All of the participants indicated that they learned a foreign language at school between ages 12 and 16 (in most cases it was English) and then continued learning a given foreign language at various settings (college and university levels) depending on what education mode they pursued. This creates variation between parents who learned English at school and those who may have only started learning English later, however, parents' skills in English are not tested in this study. These participants reported using Polish when speaking to a partner at home or with Polish friends and in the Polish community but most importantly parents reported using Polish when talking to their children. This indicates that the heritage children in this study would be exposed to a rich input in L1. The results from this group will be representative of the linguistic input to which heritage children are exposed and will allow me to statistically test if the heritage grammar diverges significantly from L1 control grammars regarding the properties I am investigating. Testing the output of the parents of the heritage speakers might be helpful with establishing the input they receive. Following Montrul (2018) looking at the heritage parents, who are the main source of input for their children, should help address the question of whether the type of input they receive at present exhibits changes due to attrition and if there are any input effects from parents.

Another set of participants who represent the control group are Polish monolingual children. They are speakers of L1 Polish aged 4-5 at the time of the experiment. In order to be qualified to participate in this study participants had to have two Polish parents and it was pertinent that

they were all born and grew up in Poland. To recruit this group I approached a pre-school[7] in my home town in the south region of Poland. This town matched Southampton in the number of inhabitants. Most importantly, Polish monolingual children matched Polish heritage children in age and represented similar socio-economic background. Overall, there were 30 participants in this group which included 16 girls and 14 boys. Age of participants at the time of the experiment ranged from 4.0 to 5.0 with an average age of 4 years 5 months. All of the Polish monolingual children in this study were born and raised in Poland to both Polish parents and speak standard Polish. Similarly to the Polish heritage children, these participants are representative of the whole Polish heritage population with respect to gender (males and females).

The next control group are the Polish monolingual adults who are speakers of L1 Polish living in Poland. Overall, there were 20 participants in this group which included 15 females and 5 males. Age of participants at the time of the experiment ranged from 29 to 40 with an average age of 32 at the time of the experiment, which closely matched the age of the Polish heritage parents (33). These participants match the heritage parents tested in this study in terms of gender, who are also predominantly female. All of the Polish monolingual adults in this study were born and raised in Poland to both Polish parents and speak standard Polish. They range in education level from further education (college) to university graduates. Participants in this group reported learning English at various settings (both primary, secondary, college and university levels) however, none of them use it regularly at work and none of them lived abroad for substantial period of time.

The final control group involves English monolingual children who are speakers of L1 English aged 4-5 at the time of the experiment. Including this control group meant that it was possible to compare the proficiency in English of Polish heritage children with the monolingual English speakers of the same age also entering Reception who go through the same process of starting school. English monolingual children matched Polish heritage children in age and represented similar socio-economic background. Overall, there were 20 participants in this group which included 11 girls and 9 boys. Age of participants at the time of the experiment ranged from 4.0 to 5.0 with an average age of 4 years 5 months. All of the English monolingual children in this study were born and raised in England to both English parents and speak Standard English. Similarly to the Polish heritage children, these participants are representative of the whole Polish heritage population with respect to gender (males and females).

[7] It should be noted that children in Poland do not start compulsory primary education until the age of 7. Until then, they attend a pre-school setting which also includes Reception.

In the following section, I present the methods employed in this study to investigate the research questions and predictions.

5.5 Methodological design

This study is divided into two different points in time: Time 1 (start of Reception) and Time 2 (end of Reception) and each participant had a set of tasks to complete depending on which group they belonged to. Below, in Table 5 I specify which tasks they took which include production task (Frog story), AJT (video task), sociograms and a picture description task. I will also present results of a small follow up study in Chapter 6 conducted at Time 3 (at the end of Year 1 which follows Reception in the UK school system) to see how change has or has not persisted over the course of the first year.

Table 5 Participation in tasks

	Frog story	*Video task*	*Sociograms*	*Picture description task*	*Grammar tests*	*BiLEC*	*Time 1*	*Time 2*
Polish hertitage children	✓	✓	✓	✓	N/A	✓	✓	✓
Polish monoligual children	✓	✓	N/A	✓	N/A	N/A	✓	N/A
Polish heritage parents	✓	✓	N/A	N/A	✓	✓	✓	N/A
Polish monolingual adults	✓	✓	N/A	N/A	✓	N/A	✓	N/A
English monolingual children	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A

In the next section, I provide a detailed description of these tasks.

5.5.1 Experimental tasks

The tasks below (production task and AJT) were designed to elicit both language production and grammatical knowledge data with regards to case marking in Polish. The need for these two types of data is that "if both of them line up, then the final conclusion concerning a certain aspect of heritage grammar will be stronger" (Polinsky, 2018: 87) and will reasonably allow us to conclude that this aspect of their grammar is part of their linguistic knowledge (if a speaker can both produce and understand a given structure). Production data allow us to conclude that speakers have the ability to use and produce certain linguistic expressions, whereas data from the acceptability judgement task testing grammatical knowledge allow us to conclude whether they know a given linguistic structure (Montrul, 2016). Collecting both types of data is a common practice in heritage research and research with children (e.g. Laleko & Polinsky, 2013; Kim & Kim, 2022).

5.5.1.1 The production task

In the oral production task, participants were asked to retell a 24-page picture book by Mercer Mayer (1969) called *Frog, where are you?* (see some exemplary pages in Appendix B). This type of production task is well-suited to eliciting narratives and has been used in previous studies (Berman & Slobin, 1994; Polinsky 2008; Polinsky, 2011; Boon, 2014; Wolski-Moskoff, 2019). This task was designed to test the use of cases in Polish and more specifically, nominative, genitive and locative. It proved especially useful in the case of young children who cannot read or write yet. Instead, they were asked to describe the narrative in their own words taking as much time as needed (they were not allowed to look through the book prior to story retell in order to retain their maximum interest in the task). I sat down with each child and I would turn the pages for them so that they did not skip through any of the pictures. At the same time I had a set of questions prepared which I would ask them as we were going through the story that elicited the production of the particular cases I was interested in. This task was employed with all of the participants in this study. By using the same instrument such as the picture book across different groups of participants, I was able to elicit language samples that were not only comparable, but most importantly consisted of similar vocabulary and grammatical structures such as cases that were elicited with the help of additional questions. These focused most specifically, but were not limited to nominative, genitive and locative, i.e. the three cases tested in this study. The use of added questions was to counterbalance the situations where some of the cases would be used at lower rates that would not allow for quantitative analysis. The task provided adequate material to check the mastery of cases in production and to analyse the

nominal morphology of the participants. All of these conversations were recorded. On average, it took around 10 minutes for the heritage children to retell the story and just under 10 minutes for the monolingual children; around 5-8 minutes for the heritage parents and similar amount of time for the monolingual adults. Heritage children produced between 70 and 400 words with an average of 210 words; Polish heritage parents produced between 206 and 524 words with an average of 325 words; monolingual children produced between 74 and 340 words with an average of 235 words.

5.5.1.2 The Acceptability Judgement Task

Testing grammatical knowledge allows to verify whether speakers know particular words, affixes and structural patterns (Montrul, 2016), hence the Acceptability Judgement Task (AJT) was designed to test participants' judgement of grammatical and ungrammatical sentences with nominative, genitive and locative case. If starting school in a majority language affects the acceptability of case inflections, this prediction can be directly tested using the AJT.

AJTs "measure the acceptability of particular language structures" (Polinsky, 2018: 95). In this study, a polar AJT was designed because it would be easier for the children. These are tasks where "participants are presented with a set of linguistic materials and are asked if a particular stimulus is correct" (Polinsky, 2018: 95). The order of the sentences was randomised for each case which prevented the same case to be presented one after another to disallow for any cueing effect. Three cases – nominative, genitive and locative – were included and tested and there were 8 sentences for each case (4 grammatical and 4 ungrammatical) which altogether amounted to 24 sentences in the task. Table 6 below contains some examples of the sentences used in this study.

Table 6 Examples of cases tested in the AJT

Type of variable	**NOMINATIVE**
Grammatical	Żaba lubi muchę. Frog-SG-F-NOM like-PRS-3-SG fly-SG-F-ACC "A frog likes a fly".
Ungrammatical	Dziewczynką lubi lalkę. girl-SG-F-INS like-PRS-3-SG doll-SG-F-ACC "A girl likes a doll". **Correct sentence:** Dziewczynka lubi lalkę. girl-SG-F-NOM like-PRS-3-SG doll-SG-F-ACC
	GENITIVE
Grammatical	To jest książka mamy. this-SG-N be-PRS-3-SG book-SG-F-NOM mum-SG-F-GEN "This is mum's book".

Ungrammatical	To jest bułka siostra. this-SG-N be-PRS-3-SG roll-SG-F-NOM sister-SG-F-NOM "This is sister's roll". **Correct sentence:** To jest bułka siostry. this-SG-F-NOM be-PRS-3-SG roll-SG-F-NOM sister-SG-F-GEN
	LOCATIVE
Grammatical	Ryba pływa w rzece. fish-SG-F-NOM swim-PRS-3-SG in-PREP river-SG-F-LOC "A fish swims in the river".
Ungrammatical	Zabawka leży na podłogę. toy-SG-F-NOM lie-PRS-3-SG on-PREP floor-SG-F-ACC "A toy lies on the floor". **Correct sentence:** Zabawka leży na podłodze. toy-SG-F-NOM lie-PRS-3-SG on-PREP floor-SG-F-LOC

With the genitive case the emphasis was put on the possessive function as this is the role of genitives *'s* in English. All of the sentences followed the same word order (subject+ verb+ noun), but the different cases appeared in different parts of the sentence. Nouns had the same grammatical gender (feminine) and number (singular) to exclude any interference from any other grammatical properties. This made it possible to tell if the participants were challenged by the case of a particular example and not by some other feature such as gender or number. Examples 27 and 28 illustrate this below:

(27) Żaba lubi muchę.
frog-SG-F-NOM like-PRS-3-SG fly-SG-F-ACC
"A frog likes a fly".

(28) Mucha siedzi na bułce.
fly-SG-F-NOM sit-PRS-3-SG on-PREP bun-SG-F-LOC
"A fly sits on the bun".

The rationale for the ungrammatical sentences was based on the findings from the previous studies with Polish adult heritage speakers (e.g. Koźmińska, 2015; Laskowski, 2009) who would use other cases to replace genitive or locative (e.g. nominative or accusative or in some cases instrumental). The nouns included in the AJT were expected to be known by children of that age (e.g. *fly, frog, floor, river, grass* etc.) and they were relatively similar in terms of being highly frequent and fairly simplistic (i.e. not too long or difficult). I applied the same strategy to verbs (e.g. *like, love, eat, sit* etc.). In this task, I chose not to include fillers with the children due to already abundant number of examples testing the grammatical feature as any additional sentences would add to the cognitive load (Ambridge & Rowland, 2013). The participants were presented with the task in a video format. The methodology employed in this task followed the

one used in the studies of child language acquisition. In these studies (e.g. Tomasello & Brooks, 1998; Matthews *et al.*, 2005), "the child hears a sentence, generally spoken by a puppet who, the child has been told, sometimes makes mistakes or 'says things a bit silly'" (Ambridge & Rowland, 2013:11) and their task is to tell the puppet if the puppet said it right or the latter. Following Ambridge and Rowland (2013), this type of task is advantageous with children as young as 3-4 years as they do not need to worry about correcting the experimenter directly, hence it was considered as a suitable tool in this study considering the young age of the participants. Based on the previous studies, I created a video with a rat puppet that pronounced sentences with cases in a randomised order. This task involved watching a video recording of a rat puppet. Children were animated and happy to answer if the sentences that the rat produced were correct and if not, in most cases they happily corrected him. I would pause the video after each sentence to ensure that children had enough time to answer the question. Below I present a screenshot of the video.

Figure 4 Screenshot of the puppet video task

I was careful for my voice to sound as natural as possible and not to act out in a silly voice so that children would not base their judgements on the rat's behaviour (e.g. the rat behaving silly or good), but on grammaticality. Their overall behaviour when correcting the sentences (e.g. focussing on the correction of the sentences rather than making comments on the rat's behaviour) proved that this was not the case. Children were required to decide whether the utterance produced by the rat puppet was correct or incorrect as opposed to producing any language as in the previous task. However, I did ask them for clarification (correction) when they judged sentences to be ungrammatical. At the end of their test they were given their reward and they were busy looking through the book whilst I then tested their parent. As the whole session was being audio-recorded, so were their judgements.

All of the participants in this study were asked to perform this AJT and all of their responses were audio recorded. Running an adult control group on child language studies using the same materials is a common practice (Ambridge & Rowland, 2013), hence I decided to use the same video with the adults, but used a disclaimer at the start of the study stating that this test was originally designed for children and they should not worry if it seems a bit 'babyish' – and that I just wanted to find out what adults do in comparison to children. The adults were comfortable with this task and very understanding of the need to compare them to their children using the same materials.

5.5.1.3 The Piloting

The tasks were piloted once with a very small number of participants. Pilot 1 was administered to 2 heritage speaker children (with 1 Polish parent each) and 2 heritage parents as well as 2 controls (1 monolingual Polish child and 1 monolingual parent in Poland). All of the participants were recruited via family relations. Table 7 summarises the participants' demographic information.

Table 7 Participants' demographic information of the pilot

	Heritage children	***Heritage parents***	***Polish monolingual child***	***Polish monolingual adult***
Total	N=2	N=2	N=1	N=1
Gender	F=2	F=2	F=1	F=1
Mean age (in years)	4.0 (SD=0)	35 (SD=1.5)	4.2	40

The main aim of piloting was to test the suitability of the materials for the following tasks: picture description task, sociogram, production task and AJT as well as testing whether they needed to be adjusted in length due to the young age of the participants. No adjustments were necessary for the AJT which contained 24 items as this number of sentences proved very manageable by the two heritage children who were tested. They were also able to follow the instructions for the sociogram and enjoyed drawing their circle of friends at school. Similarly, they were able to follow the other two tasks (i.e. production task and picture description task). The Polish monolingual adult felt comfortable with the video puppet task which confirmed its suitability. Below in Table 8, I present results for the pilot of the AJT.

Table 8 Results from piloting

	Nom	*Loc*	*Gen*	*Picture description task (WPM) (Polish)*	*Picture description task (WPM) (English)*	*AJT*
Heritage child 1	8/8 (100%)	7/8 (87.5%)	8/8 (100%)	73	60	15/15
Heritage child 2	8/8 (100%)	8/8 (100%)	8/8 (100%)	102	76	14/15
Heritage parent 1	8/8 (100%)	8/8 (100%)	8/8 (100%)	N/A	N/A	15/15
Heritage parent 2	8/8 (100%)	8/8 (100%)	8/8 (100%)	N/A	N/A	15/15
Monolingual child	8/8 (100%)	8/8 (100%)	8/8 (100%)	85	N/A	15/15
Monolingual adults	8/8 (100%)	8/8 (100%)	8/8 (100%)	N/A	N/A	15/15

Overall, the results were mixed for the heritage children and whilst one heritage child showed reduced accuracy in locative the other one made no mistakes and similarly to the monolingual children in Poland, presented with 100% accuracy. The nouns used in the examples in the AJT had the same grammatical gender (feminine) and number (singular) to exclude any interferences from any other grammatical properties so that it was possible to tell if participants were challenged by the case of a particular example and not by some other feature. The literature on gender acquisition in monolinguals says that the order in which gender is most likely acquired earliest is masculine animate, feminine and neuter (Smoczyńska, 1985). However, because the participants in this pilot study made an error that involved an animate masculine noun, which supposedly is acquired earliest in monolinguals, I decided to include feminine only nouns that all end in the same vowel 'a' (e.g. *krow-a, drog-a*), because in this pilot study the participants have correctly used the feminine nouns. What is more, Brehmer (2021) concludes that children do not have problems with feminine gender if it ends in 'a', but only with the nouns that end in a consonant with less clear gender cues. The proficiency results were comparable between the heritage children and monolingual children. Due to the low number of participants the conclusions can only be tentative and as mentioned before the main aim of the piloting was to assess the suitability of the tasks which proved acceptable. When asked, the children participating in the pilot found the tasks engaging and manageable as well as the adults who understood clearly what was expected of them in each of the tasks.

5.5.2 Proficiency tests

All of the participants in this study, i.e. both children and adults had their proficiency tested in Polish. Additionally, Polish heritage children had their proficiency tested in English. The purpose of proficiency testing was to establish a proficiency profile of heritage children and compare it to the monolinguals in order to investigate the relationship between proficiency and case accuracy. Proficiency testing is common and accepted in the field (Polinsky, 2014; 2018) and widely used in heritage language studies (e.g. Kagan & Friedman, 2004; Polinsky, 2006, 2008a). The proficiency test in this study was also used to examine how their proficiency changes from Time 1 to Time 2 (if at all) and how fluent they were in any of the two languages. Testing parents' proficiency also helped to establish if there is any divergence from the Polish monolingual baseline.

As far as Polish heritage children were concerned, their heritage language proficiency was assessed with a picture description task measuring words per minute. This type of task has been used previously with children in heritage language studies (Polinsky, 2008b). Speech rate is the word-per-minute output in spontaneous production and is proposed as one of the diagnostics to establish a speaker's proximity to the baseline, i.e. a monolingual speaker (Polinsky, 2008; Montrul, 2016; Nagy & Brook, 2020). With children as young as 4 years of age who cannot yet read or write it would be challenging to test their grammar with a standard grammar test hence, I have chosen to use this simplified and accessible methodology with this age group. What is more, according to Polinsky (2014:13) "a measure of speech rate of a heritage speaker – i.e. words-per-minute output – has been found to correlate with the deeper grammatical abilities of speaker making it a good indicator of overall language level" (Kagan & Friedman, 2004; Polinsky, 2006, 2008a). For this task I chose a page from a coloured Polish picture book *Miasteczko Mamoko* (English: *Mamoko Town*) (Mizielińska & Mizieliński, 2011) which portrayed a busy animated scene containing a lot of objects, animals and creatures to describe. I present the picture in Fig. 5 below.

Figure 5 Picture description task

In this task children were required to describe what they could see in the picture in as much detail as possible in 1 minute. I explained to them that this task would be timed and allowed them to start the timer. The timer was in fact set for 3 minutes to allow for extra time in case of any other external factors interfering with the task. The heritage children were first asked to describe it in Polish and then to try to describe it in English. Understandably, Polish monolingual children were not asked to describe the picture in English. All of the picture descriptions were audio recorded. Testing both heritage and monolingual children allowed for comparisons between the two groups. Additionally, I also asked a group of monolingual English children to describe the same picture in English. This meant that it was possible to compare the proficiency in English of Polish heritage children with the monolingual English speakers of the same age also starting Reception, so both groups were going through the same process of starting school.

Polish heritage parents and monolingual adults in Poland also had their proficiency measured in Polish. In order to test their Polish, I used of an official placement test (Foreign Language Centre, Krakowska Akademia) that contained 100 questions, most of which were multiple choice questions or sentences requiring gap filling. For a native speaker of Polish this test would take around 10 minutes to complete. This placement test ranged from A1 level (beginner) to C2 level (advanced) (see Appendix E). I used a standardised written grammar test as the heritage parents are literate in Polish. Comparing heritage parents with the monolingual adults in Poland helped to establish if parents living in the UK diverge in any way from the monolingual speakers.

5.5.3 Sociograms

In order to investigate to what extent linguistic changes are influenced by the heritage children's social networks I used sociograms to record heritage children's networks. Below I present an example of one of the sociograms produced by a heritage Polish child in Fig. 6.

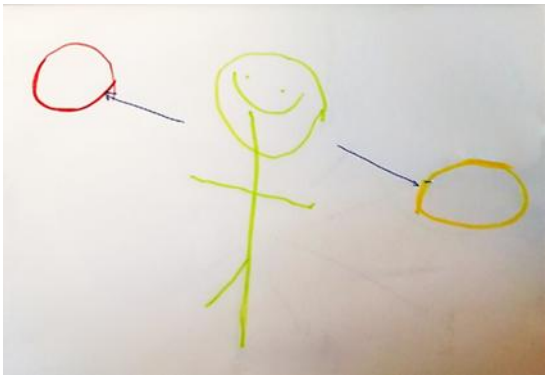


Figure 6 An example of child heritage speakers' sociogram

Sociograms are a self-report type of methodology used previously in sociolinguistic studies (e.g. Eckert, 2000; Mendoza-Denton, 2008; Ryan, 2018) asking children to write their name in the middle of a blank sheet of paper, then around their name write the names of the most important people in their life and then add coloured circles to indicate what languages they use with the people on the sociogram. Yellow felt-tip pen was used for people who they spoke mostly Polish with and red felt-tip pen for people they spoke mostly English with. The analysis included only friends at school. Although these are self-report type of procedures, I did give the children appropriate level of assistance with this task due to their very young age. This task was used as an introductory task and an extension to the natural conversation held when getting to know each child at the visit during which each individual child heritage speaker was tested. As I was getting to know each child through play and conversation I took out the sociogram and asked if they would like to do this first task with me explaining what it was and what they needed to do. Most of the children were very keen to draw their own name in the middle though a couple needed some help. This did not put them off the task. I assisted each child with the next part where I had to write the names of the most important people in their life. I recorded the conversation, in Polish, while drawing the sociogram with the child as during that time I was asking the children for clarification and additional information to make sure they understood what the task was about, e.g. which people were family members and which were at their school as the latter was the group I was most interested in. Next, children would take the yellow and red pen and circle the names to indicate which languages were used with a given person. I would point to the name as they could not yet read at this stage of their development and I would ask if they wanted to use the yellow or the red pen depending on the language they used with a given person. This task proved very easy to follow by the children and they enjoyed telling me about their friends at school.

This methodology created a clear visual data of the friendship networks and language use and proved comparable across individual participants. Following similar methodology regarding sociograms in other studies (Ryan, 2018), I consider a network which has the following

characteristics to be a 'Low Polish' network: no Polish friends and only English friends; a network which has the following characteristics to be a 'Medium Polish' network: some Polish and some English friends and finally, a network which has the following characteristics to be a 'High Polish' network: Polish only friends and no English friends. I validated the sociograms with the parents who were able to confirm the identities of the people included in the visual diagrams. The social networks were used to establish if there was a productive connection between the sociological and syntactic change through the use of statistical calculations. Social network type (Low Polish, Medium Polish, High Polish) will be used as a factor (independent variable) in my analysis. This task was employed only with the Polish heritage children.

5.5.4 Bilingual Language Experience Questionnaire

A substantial bilingual exposure questionnaire BiLEC (Bilingual Language Experience Calculator, Unsworth, 2013 (see Appendix C)) was used to collect information concerning the heritage children's language experience and their language history and provided valuable demographic data regarding the language background and language use of the heritage children, which were calculated using parental input.

Unsworth's (2013) standardised questionnaire designed for use with children aged between 2 and 18 years, was adapted for the purposes of this study and contained questions that collected data on the participant (heritage children), their parents and their siblings such as age, date and place of birth and parental education as well as their occupation. With regards to language use it included questions on when and where children use their two languages such as Polish and English, which of these two languages parents speak to their children, how often they speak them, and how well they speak and understand each of the languages spoken at home or how much time children spend at daycare or school etc. Moreover, it also asked at which age parents and siblings started using Polish and English with the heritage children. I adapted the questionnaire by adding more questions regarding parents' arrival into the UK and what languages they learnt at school and when.

Upon completion of the questionnaire and entering parental responses into the spreadsheet, a variety of measures of language exposure were automatically calculated and generated. The variables that I extracted included: Age of exposure to English, Hours a week Polish, Hours a week English, Average Polish spoken (%), Average English spoken (%), Richness of exposure to Polish vs. English (%), Cumulative length of exposure to English vs. Polish (in years), Average exposure to Polish per week (home/school/extra/holidays etc. (%)), Average exposure to English per week (home/school/extra/holidays etc. (%)). These are self-explanatory apart from RoE

which includes a calculation of the relative proportion of other sources of language exposure (extra-curricular, TV/media, friends, computer/internet, reading/being read to) (Unsworth, 2013).

This questionnaire was helpful in trying to estimate the amount of input that heritage speakers receive in Polish and in English (both in quantity and quality) and relative dominance of these two languages. Quantifying precisely the quality of exposure that children receive is a very challenging task, however. According to the literature input quality is defined broadly as access to various sources of exposure to the heritage language (e.g. Polinsky & Scontras, 2020). Following Unsworth (2013: 9), it is important to remember "given that this measure is based on report data, it is only an approximate estimation of children's language exposure". However, what parents report about their children linguistic milestones is generally considered to be a valuable tool (Unsworth, 2013; Paradis *et al*., 2010).

Data from this background questionnaire was relevant as it contained information that was considered statistically as factors that might be facilitative or non-facilitative, e.g. attending a Polish Saturday school or amount of exposure (the latter being shown in literature as the most important predictor of bilingual language acquisition – Gathercole & Thomas, 2009; Armon-Lotem *et al*., 2011, Unsworth, 2013). Collecting the data related to the exposure to both languages (amongst other characteristics) allowed me to test if there were any association between all of these variables and grammatical outcomes in the heritage speaker children. It is important to gather this type of data as opposed to just testing grammatical properties on their own, so that we can understand the influence of individual differences on heritage speakers' linguistic outcomes.

Next, I describe the procedure for data collection which is then followed by a procedure for data analysis.

5.6 Procedure for data collection

The following section includes a description of the testing protocol and procedures used in this study.

The participants were recruited on a voluntary basis following an ethical approval from ERGO at the University of Southampton (ERGO Ethics no. 66550), which was received prior to testing. All of the subjects enrolled in this study were informed of the purpose of the research and equally they were notified that they could withdraw from this study at any time. Following ethical guidelines each of the participants received a participant number so that they could not be directly identified, their data was securely stored and encrypted on a password protected

laptop. Participants received an information sheet regarding the study before they took part. Consent was obtained from all of the participants and parents were asked to sign the two separate consent forms – one for the parent and one for the child.

Polish heritage children and their parents were tested in their homes in the UK, whereas Polish monolingual children and adults in Poland were tested remotely via online communication platform such as Microsoft Teams. The latter was necessary due to the situation related to the Covid-19 restrictions that were in force due to Covid-19 pandemic. Recent research reporting a substantial degree of overlap in interview experience (e.g. Leemann *et al*., 2020; Eschman *et al*., 2022) suggests that using online platforms (e.g. Microsoft Teams, Zoom) is similar in results to doing in person data collection. All participants were tested individually in a quiet space. Before visiting the children in the UK, I sent out via email a Participant Information Sheet for parents and an Information Sheet for the children. Parents were able to familiarise themselves with the study and explain briefly to their children what it would involve before they decided to take part in the study. They were informed prior to my visit that it would take around 2 hours. Before embarking on the tasks I asked them to sign the two separate consent forms – one for the parent and one for the child. They were also informed that they could withdraw from the study at any point and that they could ask as many questions about the study as they needed. After signing the consent forms, I asked the parents to complete the BiLEC questionnaire whilst I made myself familiar with their child. The questionnaire was translated into Polish so that the parents could comfortably answer the questions in their mother tongue without any additional pressures. Whilst the parents were given the task to fill out the questionnaire independently, I informed them that if they struggled with any of the questions, they could ask for clarification or additional information. What is more, towards the end of my visit I went through each question together with the parent in order to double-check for any omissions or discrepancies.

I reminded the parents that I started recording right from the beginning of my visit with a digital voice recorder. All of the participants' responses were recorded with the same device. At the start of my first visit, I anticipated that children may be slightly reserved about a stranger visiting their house, but I have taken steps to mitigate this as much as possible by being friendly and giving them my full attention as well as showing heightened interest in their toys and playing with them. This approach helped them relax and they eagerly engaged in a natural conversation with me using Polish before I attempted to carry out any tasks. It acted as a warm-up activity allowing me to get to know the participant. Before embarking on the first task, I motivated the children to take part by reminding them that they would receive a reward after completing all of the tasks at the end for taking part (a surprise (a small toy), an incentive in the amount of £30 and a book in Polish about learning to read). Throughout the task completion they also received a lot of stickers depending on their individual interest. First, I carried out the tasks with the

heritage children and I gave them plenty of time in between each task. The first task the children were given was the sociogram, which was followed by the picture description task. Then children completed the Frog story task which was finally followed by the video task. Throughout the visit I have been recording not only the tasks, but also the natural speech of participants whilst they engaged in conversation with me, which could act as a potential material for cross-reference.

All testing of Polish monolingual children took place individually in a quiet room via video chat in Microsoft Teams with a pre-school teacher present during the sessions. Although arguably this adds a slightly different dynamic to the task, I took all the necessary steps to alleviate any potential problems. First of all, I carried out the tasks with an assistance of a pre-school teacher that I personally know and feel comfortable with which, in our opinion, instantly relaxed the children. Secondly, before the session I familiarised the pre-school teacher with all of the materials and explained the procedure. All monolingual children were given the same set of tasks and instructions as the heritage speakers in their native language. The entire conversation was recorded with an external digital voice recorder. The monolingual children responded very well to this task with few exceptions where they had to be reminded to focus their attention back on the task, but this seemed to have been more age related rather than as a result of carrying the tasks via an online mode. Their noticeable ease with this type of device could be due to an overall increased screen time during the pandemic and it seems like doing the tasks online is just a new normal for this generation, but perhaps also slightly helped by the fact that they were monolingual children.

All testing of English monolingual children took place individually in a quiet area at their school in an environment that these children were familiarised with. Before embarking on the first task, I motivated the children to take part by reminding them that they would receive a reward after completing the task at the end for taking part (stickers). Also, before the task I showed them the stickers and had a little chat about their day at school and their favourite toys etc. to make them feel at ease. The entire conversation was recorded with an external digital voice recorder. Testing of monolingual adults took place individually at a suitable time for both the participant and the researcher similarly as with the monolingual children via video chat in Microsoft Teams, which has been recorded as well.

This experimental methodology created for the purposes of this study with multiple tasks and multiple experimental groups provided a rich data set and what is more, it is replicable and can be used in other language combinations.

5.7 Procedure and methods for data analysis

First, I transcribed the recordings using Microsoft Word for all participants, i.e. heritage children and parents as well as monolingual children and adults. For the Frog Story (production task) I extracted all of the nouns into a spreadsheet and coded them accordingly assigning them into case categories that I was interested in investigating, i.e. nominative (Nom), genitive possessive (Gen poss) and locative (Loc). These were then coded for Accuracy as a separate variable in the data frame: 1 for a noun that was inflected correctly and 0 for a noun that was inflected incorrectly. The nouns were also coded for time point (start of Reception/end of Reception), Participant Category (monolingual children/heritage children/parents) and alternative case used (case substitution). This was saved as a master data frame for the production task and contained not only the above data, but also further information relating to the heritage children (ID, siblings, birth order, mother's education), proficiency information (WPM), BiLEC questionnaire variables and social network information.

For the AJT, I extracted the nouns from the sentences into a new spreadsheet and coded them for condition (Nominative, Genitive, Locative), grammaticality (grammatical or ungrammatical) and accuracy (each correct answer was given 1 point and each incorrect answer given 0). These were also coded for time point (start of Reception/end of Reception), Pariticipant Category (monolingual children/heritage children/parents) and alternative case used (case substitution). This file was saved as master data frame for the AJT data and contained the above as well as further heritage child information (ID, siblings, birth order, mother's education), proficiency (WPM)), BiLEC questionnaire variables and social network information.

First, I calculated descriptive statistics for the heritage children at both time points, the monolingual children and the parents. For both the children's production data and the children's AJT data, I conducted two analyses using the statistical software R (R Core Team, 2017). One was between groups where I fitted Group as a fixed effect (coded 3-ways, monolinguals, heritage start and heritage end of Reception). The second analysis was focused on the longitudinal data of the heritage speakers in isolation so that I could test the effect of the individual difference variables from BiLEC. In order to conduct these analyses, I used subsets of the master production data frame and AJT data frame described above, I performed statistical analyses using mixed effects binary logistic regression with Accuracy as the (binary) dependant variable, a Case*Group interaction as fixed effect (Case*Time Point for the heritage-only longitudinal analysis) and Participant and Item as random factors. Mixed effects logistic regression is a statistical analysis that is used to model binary variables and contains both fixed effects and random effects (Winter, 2020). The main reason for using this model was the character of my dependent variable which was binary hence a binomial logistic regression was

suitable. This study is longitudinal in character and it contains repeated observations over time of the same subject. Mixed effects logistic regression models are especially useful in studies of this type (Yang *et al.*, 2014). The advantages to using mixed effects over traditional statistical analyses like t-tests/anovas/chi-square is that the mixed effects allow to account for both repeated measures like Participant and Item within one model, as well as both continuous and categorical fixed effects (Linck & Cunnings, 2015). In the longitudinal analysis, I tested variables which are detailed below as a main effect to see if any individual variable predicted accuracy irrespective of Time Point and then I also tested variables as an interaction with Time Point. Including an interaction between a given variable and Time Point meant that I could see whether the effect of this variable on the dependent variable at Time 1 was different from at Time 2. If there is a difference, then it would appear that the difference between Time 1 and Time 2 in the dependent variable is not equal across all values of the variable in question. For example, for Richness of Exposure (RoE) those with higher RoE might make greater gains than those with lower RoE. By effects coding Time Point in these interactions, I was able to see if any of the variables under investigation (see below) were significant as main effects (e.g. across time points) while also evaluating whether their relationship with the dependent variable was different at Time 2 compared to Time 1. Significance was determined using likelihood ratio tests through the 'drop1' function from the lmerTest package. This compares the fit of a model with the variable to a model without the variable. After running the smaller models, I then obtained all of the significant variables ($p < .05$) to run a multivariate model. If not all variables remained significant in this multivariate model, I would then re-run the model with only the significant variables. I included random slopes (by-participant, by-item) for all variables in the final model to provide a maximal random structure (Barr, 2013) and this was only reduced to avoid convergence issues. The variables that I tested were: Wpm Polish, Wpm English, Age at testing, Age of exposure to English, Hours a week Polish, Hours a week English, Average Polish spoken, Average English spoken, Richness of exposure to Polish vs. English, Cumulative length of exposure to Polish vs. English, Average exposure a week to Polish vs. English, Siblings, Birth order, Mother's education, Social network, Grammaticality. I included these variables as fixed effects because these are the exploratory or otherwise independent variables that I assumed would have some sort of effect on the dependent variable (i.e. Accuracy). I included them in order to investigate how they contribute to accuracy rates and in making conclusions about them to answer my research questions.

I also ran a series of linear mixed effects models for the heritage speakers' longitudinal proficiency data with Proficiency (WPM) as the dependant variable, a Language*Time Point interaction (with Time Point coded 2-ways: heritage start and heritage end of Reception) and Participant as a random effect. Significance of fixed effects was determined using F tests

likelihood ratio tests through the 'step' function from the lmerTest package (Kuznetsova *et al.*, 2017). In order to test the effect of a number of individual differences, first I fitted smaller models with the variable as a main effect and the interaction between the variable and Time Point. I then obtained all of the significant effects ($p < .05$) to run a multivariate model. Once this combined model was fitted, I would then re-run the model with only the significant variables while adding random slopes (by-participant, by-item). I aimed for final models with maximal random structure (Barr, 2013) with this only reduced to avoid convergence issues. The variables that I tested in initial modelling were: Age at testing, Age of exposure to English, Hours a week Polish, Hours a week English, Average Polish spoken, Average English spoken, Richness of exposure to Polish vs. English, Cumulative length of exposure to Polish vs, English, Average exposure a week to Polish vs. English, Siblings, Birth order, Mother's education and Social network. I used the following packages: lmerTest (Kuznetsova *et al.,* 2017), lme4 (Bates *et al.*, 2015) and plyr (Wickham, 2011).

5.8 Summary

To summarise, this chapter has provided a description of the experimental design used in this study and has also provided descriptions of the participants, the experimental methods used (a production task and AJT, a proficiency task, sociograms and a bilingual experience questionnaire). Finally, I elaborated on the procedures for data collection and data analysis. In the next chapter, I present the results of the study.

Chapter 6 Results

6.1 Introduction

This chapter outlines the results of the study, but first I recount the goal of this thesis, its predictions and research questions being investigated.

6.1.1 Aims, predictions and research questions

The principal aims of this thesis are to investigate how changes in input and exposure to the majority language affect heritage language acquisition in the first year of school, whether the heritage children's grammars are complete or not before they enter the mainstream education in the majority language and whether their grammars change as a result of changes in their linguistic environment and social networks. The research questions addressed in this study were introduced in Chapter 5 and are repeated below:

RQ 1) To what extent is there evidence of incomplete acquisition of case among these heritage children in the first year of schooling?

a) Does this vary across the three grammatical cases investigated? (i.e. Nom, Gen poss, Loc)?

b) Is this consistent across tasks?

RQ 2) Does attrition occur over these heritage children's first year of schooling?

a) Does this vary across the three grammatical cases investigated? (i.e. Nom, Gen poss, Loc)?

b) Is this consistent across tasks?

RQ 3) To what extent is any increase or decrease in accuracy during the first year of schooling explained by language input and social networks?

For this goal to be achieved and these questions to be answered, both productive command of the language from a narrative retelling task and grammatical knowledge from an AJT are considered and tested at the start and at the end of Reception as well as sociograms investigating heritage children's social networks. Additionally, in order to calculate how much input in terms of quantity and quality Polish heritage children are exposed to and to examine other potential variables, I adopted the Bilingual Language Experience Calculator (BiLEC: Unsworth, 2013), all of which are described in more detail in the preceding chapter.

Having laid out the three accounts that are used as explanations for the effects in heritage speakers: incomplete acquisition, attrition and parental input effects, these are the predictions that these three theories make.

Regarding the first account the prediction is that if the heritage children show reduced accuracy in task performance as compared to monolingual children in Poland at the beginning of the school year (Time 1), then this could mean that the case acquisition is ongoing – delayed. Regarding the second account the prediction is that if heritage Polish children in the UK perform the tasks with high accuracy at the beginning of the school year (start of the Reception – Time 1), but then at the end of the school year (Time 2) show changes in their task performance, then these changes could be a sign of the onset of attrition. Regarding the third account the prediction is that if no changes in particular cases can be observed in the parents' native language when compared to a group of monolingual Polish adults in Poland, but the heritage children show reduced accuracy in task performance in Time 1, then parental input effects are less likely to be a factor.

Finally, I also investigate the social environment as potentially significant in the grammars of heritage Polish children starting school in the UK. Polish heritage language friendships constitute another source of input and another source of exposure to the heritage language; therefore, they may turn out to play an important role in the heritage language development. I predict that those heritage Polish children who have more Polish networks (Polish friends) at school would show more correct use of cases, whereas those heritage Polish children who have more English networks (English friends) would show more incorrect case use and more reductions in case marking, which will support the input/exposure as an influential factor in heritage language development.

6.1.2 Structure of the chapter

In the following Section 6.2, I provide both descriptive and analytical results of the production task (narrative task) and AJT, where I examine the accuracy rates of the three cases, i.e. nominative, genitive and locative, comparing them across the three groups of participants (i.e.

Polish heritage children, Polish monolingual children and Polish heritage parents). I analyse differences in Polish heritage children in Time 1 and Time 2 of the study comparing their accuracy rates for cases within the same group of participants and examine whether any particular variables from the BiLEC questionnaire significantly explain variation across time points. What is more, I also analyse the results regarding the social networks in modelling. Social networks are important due to the fact that they represent an additional source of input and could at the same time act as a factor that increases or decreases children's proficiency which I also consider in this section. In Section 6.3, I look at the Polish heritage children individually examining variables from the BiLEC questionnaire to test whether any individual differences determine case accuracy at Time 1 or the change from Time 1 to Time 2. While Section 6.2 focuses on group analyses, in Section 6.3 I look at the individual Polish heritage children who perform lower than 100% at either time point and provide a detailed description of their linguistic profiles according to their BiLEC responses and social networks. The study's main findings are summarised in Section 6.4. Additionally, in Section 6.5, I also provide a follow-up to the results from Time 1 and Time 2 having tested 15 out of 30 Polish heritage children at Time 3, i.e. two years after they started school in order to provide continuity to this longitudinal study and explore the trajectory of change.

6.2 Descriptive and analytical results from the production task and the acceptability judgement task

As part of this section, I describe and summarise the data collected in the study from the production task (narrative task) and the AJT. Subsequently, I analyse differences in the accuracy rates between the groups as well as among Polish heritage children in Time 1 and Time 2 of the study comparing accuracy of cases within the same group. The results from these tasks will contribute to the provision of answers to the research questions in this thesis.

6.2.1 Accuracy rates within the production task

In this section, first I present descriptive results from the production task from all three groups, i.e. Polish heritage children, monolingual Polish children and Polish heritage parents. These are followed by the analytical results where I compare Polish heritage children with the Polish monolingual children and analyse the change in heritage children’s performance over time. Finally, I provide a summary of the results.

Table 9 summarises the mean accuracy rates from the three groups of participants. As can be seen from the table, Polish heritage parents participating in this study always use the appropriate case forms and show no divergence with 100% accuracy across the three examined

cases. This means that the parents' grammar appears to show no changes and resembles monolingual adults in Poland. According to the Polish heritage parents, the average number of years they lived in the UK was 10, which may be too short a period to demonstrate any differentiation (Köpke & Genevska-Hanke, 2018). From studies on L1 attrition in immigrants (e.g. Schmid & Yilmaz (2021) it transpires that the degree of erosion is very reduced. Following from this, it was expected that parents, in particular mothers with high education, would not suffer attrition and any divergence on the part of the Polish heritage children is not a result of parental input.

As can be observed further from Table 9, Polish monolingual children living in Poland similarly to Polish heritage parents always use the appropriate case forms and manifest 100% accuracy across all three cases. These children, even at the beginning of the year, show complete acquisition of the three cases compared to the Polish heritage children tested in this study. For the Polish heritage children, the same can be said about the nominative case at both time points and genitive case at Time 1: they exhibit 100% accuracy. However, towards the end of Reception (Time 2) accuracy rates for genitive decrease slightly to 96.85%. With locative, the accuracy is already nearly 10% lower at the beginning of the year for the heritage children compared to the other two groups and, what is more, it decreases by a further 10% towards the end of Reception. When comparing the heritage children to their parents and monolingual children in this study, heritage children display numerically lower accuracy rates, but not seemingly across all three cases.

Table 9 A descriptive summary of case accuracy rates in the production task across all three groups in percentages (%)

	Polish heritage children		***Polish monolingual children***		***Polish heritage parents***	
Case:	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***
Nominative Start of Reception	100 (0)	100-100	100 (0)	100-100	100 (0)	100-100
Nominative End of Reception	100 (0)	100-100	N/A	N/A	N/A	N/A
Genitive Start of Reception	100 (0)	100- 100	100 (0)	100-100	100 (0)	100-100
Genitive End of Reception	96.85 (17.48)	83.33-100	N/A	N/A	N/A	N/A

	Polish heritage children		*Polish monolingual children*		*Polish heritage parents*	
Case:	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***
Locative Start of Reception	91.74 (27.56)	66.66-100	100 (0)	100-100	100 (0)	100-100
Locative End of Reception	80.69 (39.52)	43.75-100	N/A	N/A	N/A	N/A

Following the descriptive analysis, the results from the production task were analysed using mixed logistic regression models in R as described in more detail in the preceding chapter to provide the inferential statistics. The model with three cases failed to converge hence separate models (for locative and genitive only) were fitted to test their significance as well as the variables from the BiLEC questionnaire. The nominative case was excluded from the analysis as it produced 100% accuracy across all participants. Variables were tested as a main effect to establish if any individual variable predicts accuracy irrespective of time point and also as an interaction with time point to see whether a variable modulates the change in accuracy from Time 1 to Time 2. Between-group models for both locative and genitive determined whether there was significant difference for the Polish heritage children from the controls (Polish monolingual children) at either start or end of Reception. For locative, the heritage children were not significantly different from the controls (Polish monolingual children) at either the start of Reception (β = –19.85, SE = 177.96, z = –0.11, p = .91) nor at the end of Reception (β = –20.96, SE = 177.96, z =– 0.12, p = .90). Similarly for genitive, the heritage children at start of Reception were not significantly different from the monolinguals (β = 0.11, SE = 17713.57, z = 0.00, p > .99) nor at the end of Reception (β = –20.64, SE = 11903.49, z = 0.00, p = .99).

Nevertheless, when the Polish heritage children are examined separately as a group, results show there is a statistically significant change in accuracy over time, i.e. from the start of Reception to the end of Reception. Here similarly separate models (for locative and genitive only) were fitted to test the significance of Time Point, as well as extraneous variables that may need to be controlled for and the interaction between Time Point and any of these variables. The time point effect plot in Figure 7 shows that by the end of Reception, accuracy for locative significantly decreases from Time 1 to Time 2 (β = –1.47, SE = 0.57, z = –2.58, p < .01) (see full model in Figure 8).

The single variable out of all the tested variables from the BiLEC questionnaire that proved significant was richness of exposure ratio (RoE) between Polish and English. This is calculated as a percentage and it is based on the number of sources of exposure to Polish outside the

family which I use as a representative for input quality in this study (see detailed description of this variable in the previous chapter). RoE is a variable measuring exposure to both languages: values under .5 are greater RoE to English and values over .5 indicate greater RoE to Polish. The RoE effect plot shows that as the RoE to Polish decreases (and RoE to English increases) then the accuracy for locative decreases. Because there is no interaction with Time Point, the relationship effect of RoE on accuracy does not appear to change from Time 1 to Time 2.

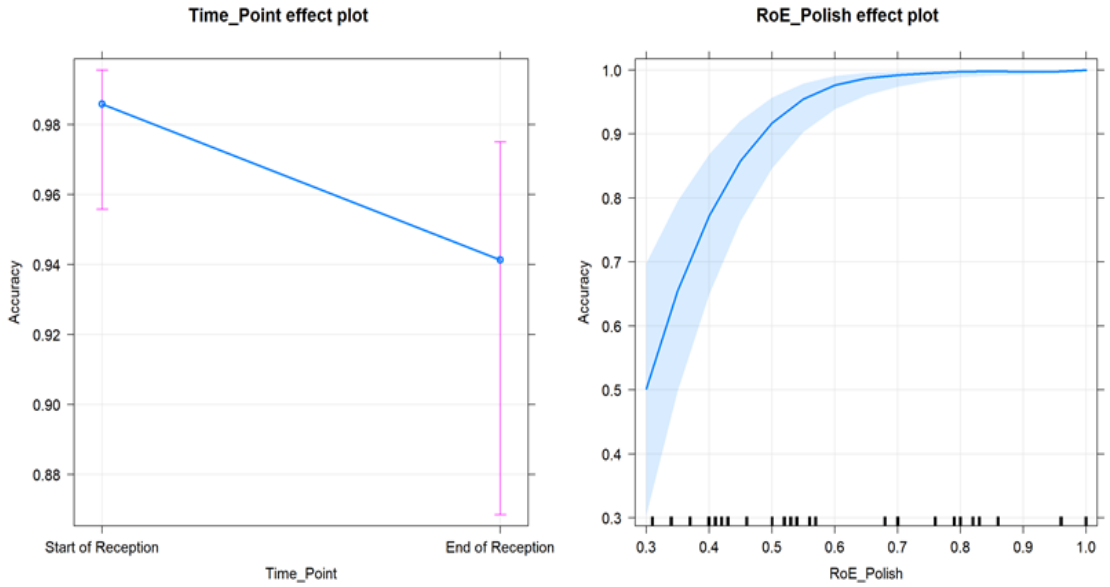


Figure 7 Production task accuracy for locative for Polish heritage children and RoE effect

Fixed Effects	Estimate	SE	z_value	p value	Significance
(Intercept)	3.51	0.45	7.85	< .0001	***
Time_PointEnd of Reception	-1.47	0.57	-2.58	0.01	**
scale(RoE_Polish)	2.17	0.34	6.29	< .0001	***
Significance levels: *** p < .001, ** p < .01, * p < .05, . p < .1					
Formula: Accuracy ~ Time_Point + scale(RoE_Polish) + (1 | Participant_ID) + (1 + Time_Point | Correct_item)					
No. of observations: 700					
Random Intercepts: Correct_item (91, Var = 1.65, SD = 1.29); Participant_ID (30, Var = 0.13, SD = 0.36)					
Random Slopes: Time_PointEnd of Reception by Correct_item (Var = 1.51, SD = 1.23)					

Figure 8 Summary of the locative production model

Having tested the genitive in the production task for Polish heritage children, I established that statistically this case does not decrease over time (β = –18.48, SE = 482.72, z = –0.04, p < 0.97).

In sum, although there is a significant change in accuracy over time this is only applicable to the Polish heritage children as a group and only to one of the cases, namely locative. When compared with the Polish monolinguals, Polish heritage children are not significantly different for any of the cases even though descriptively, they appear to be contrasting for genitive and locative. The lack of significance for locative (which is 8% lower than monolinguals at Time 1 and 19% lower at Time 2) might be due to the fact that there is simply greater variability (higher

SD) in the heritage children's locative at Time 2 (SD=39.52 as opposed to SD=27.56 at Time 1). Thus, heritage children only show some difficulties with the locative case and this is the case that is acquired latest by Polish monolingual children.

6.2.2 Accuracy rates within the acceptability judgement task

In this section, first I present descriptive results from the AJT from all three groups, i.e. Polish heritage children, monolingual Polish children and Polish heritage parents. These are followed by the analytical results where I compare Polish heritage children with the Polish monolingual children and analyse the change in heritage children's performance over time. Finally, I provide a summary of the results.

Table 10 summarises the mean accuracy rates from the three groups of participants. As can be seen from the table, similarly to the results from the production task, Polish heritage parents as well as Polish monolingual children always use the appropriate case forms and show no divergence with 100% accuracy across the three examined cases.

For the Polish heritage children, the same can be said about the nominative case at both time points and genitive case at Time 1. However, towards the end of Reception (Time 2) accuracy for genitive decreases slightly more than in the production task to 95.83%. With locative, the accuracy is just under 5% lower at the beginning of the year for the heritage children compared to the other two groups and what is more, it decreases by a further 5% towards the end of Reception. When compared to the other two groups in this study, it is immediately clear that at least descriptively, heritage children display lower accuracy rates (though not across all three cases) and that they differ in their accuracy rates from their parents and from the monolingual children, although this difference is not as prominent descriptively as in the production task.

Table 10 A descriptive summary of case accuracy rates in the AJT across all groups

	Polish heritage children		***Polish monolingual children***		***Polish heritage parents***	
Case:	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***
Nominative Start of Reception	100 (0)	100-100	100 (0)	100-100	100 (0)	100-100
Nominative End of Reception	100 (0)	100-100	N/A	N/A	N/A	N/A
Genitive Start of Reception	100 (0)	100- 100	100 (0)	100-100	100 (0)	100-100

	Polish heritage children		*Polish monolingual children*		*Polish heritage parents*	
Case:	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***	***Mean (SD)***	***Range***
Genitive End of Reception	95.83 (20.02)	62.50-100	N/A	N/A	N/A	N/A
Locative Start of Reception	95.41 (20.95)	87.50-100	100 (0)	100-100	100 (0)	100-100
Locative End of Reception	89.58 (30.61)	50-100	N/A	N/A	N/A	N/A

Following the descriptive analysis, the results from the acceptability task were analysed using mixed effects binomial logistic regression models in R similarly to the production task above following the same procedures. Between-group models for genitive confirmed no significant difference between the monolingual group and the heritage children at the start of Reception (β = –3.45, SE = 81.40, z = –0.04, p = .96) nor at the end of Reception (β = –26.46, SE = 86.31, z = –0.31, p = .76). The same was found for locative: between-group models for locative confirmed no significant difference between the monolinguals and the heritage children at the start of Reception (β = –18.04, SE = 213.01, z = –0.08, p =.93) nor at the end of Reception (β = –19.1, SE = 213.01, z = –0.09, p =.92).

Nevertheless, when examined separately as a group, results from the Polish heritage children show there is a significant change in accuracy over time, i.e. from the start of Reception to the end of Reception for locative. The time point effect plot in Figure 9 shows that accuracy for locative significantly decreases between start of Reception and end of Reception (β = –1.1, SE = 0.43, z = –2.58, p < .01) (see full model in Figure 10). A significant effect of RoE was also revealed: the RoE effect plot shows that as the RoE to Polish decreases and the RoE to English increases, the accuracy for locative decreases. This is consistent with previous studies regarding this variable (e.g. Correia, Lobo & Flores, 2024).

This model also controlled for the variable Grammaticality. The effects plot demonstrates that overall the Polish heritage children achieved better results with grammatical sentences than with the ungrammatical ones. This is consistent with heritage speakers' reported reluctance to reject inappropriate language (e.g. Polinsky & Scontras, 2020). Another variable that this model controlled for was WPM (words per minute) which is a measure of proficiency (see previous chapter) used to examine if there is any correlation between this measure and case accuracy. Although only approaching significance, the WPM Polish effect plot shows that the higher the WPM in Polish, the higher the accuracy in AJT task for locative indicating that Polish heritage

children who are more proficient or at least have a higher WPM in Polish achieved higher accuracy.

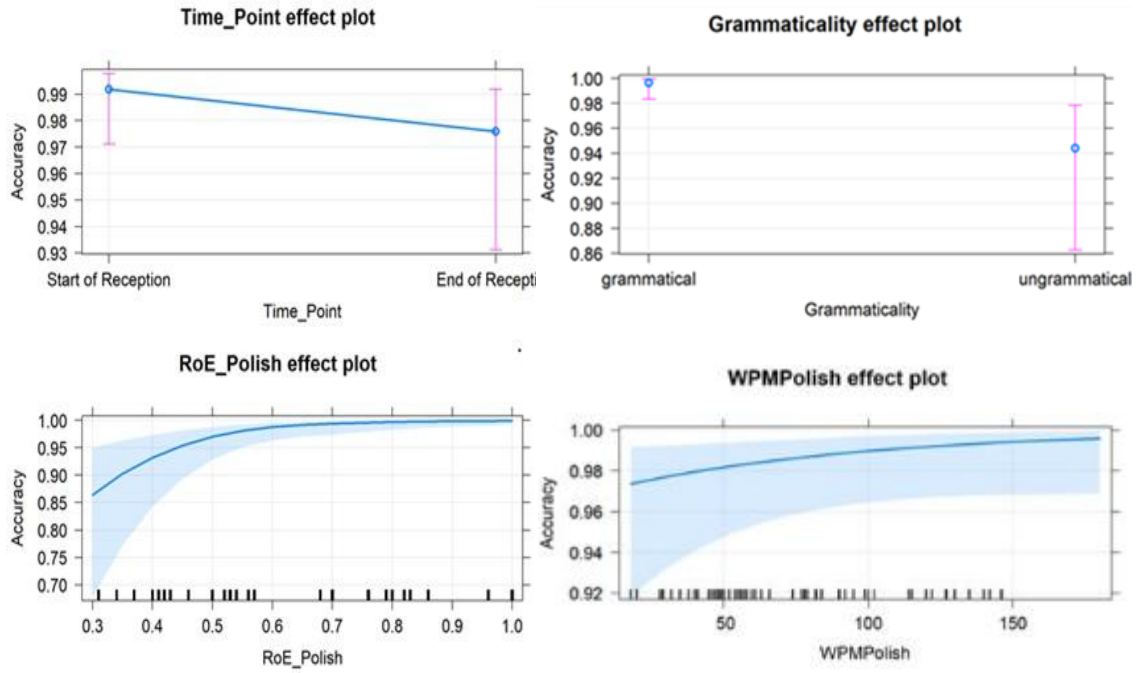


Figure 9 AJT accuracy for locative for Polish heritage children and RoE effect

Fixed Effects	Estimate	SE	z_value	p value	Significance
(Intercept)	5.12	0.8	6.44	< .0001	***
Time_PointEnd of Reception	-1.1	0.43	-2.58	0.01	**
Grammaticalityungrammatical	-2.85	0.73	-3.92	< .0001	***
scale(RoE_Polish)	1.5	0.43	3.46	0.001	***
scale(WPMPolish)	0.43	0.26	1.65	0.099	.
Significance levels: *** p < .001, ** p < .01, * p < .05, . p < .1					
Formula: Accuracy ~ Time_Point + Grammaticality + scale(RoE_Polish) + scale(WPMPolish) + (1 | Participant_ID) + (1 | Item)					
No. of observations: 480					
Random Intercepts: Participant_ID (30, Var = 0.50, SD = 0.70); Item (8, Var = 0.22, SD = 0.47)					

Figure 10 Summary statistics for the AJT for locative and RoE variable

Unlike the longitudinal model for the locative case above, in a model analysing the genitive in the AJT for Polish heritage children, Time Point was not significant: this case does not decrease over time (β = –18.59, SE = 159.21, z = –0.12, p =.90).

In conclusion, the results of this task also confirm a decrease in accuracy, but only for locative for Polish heritage children. As in the production process, RoE ratio also plays a significant role. Additionally, proficiency also seems to contribute to achieving higher accuracy in the AJT which is discussed further below, but first I comment on the results regarding social networks modelling.

6.2.3 The role of social networks

In this section, first I present descriptive results from the Polish heritage children. These are followed by the analytical results where I look at the Polish heritage children and analyse this variable in the modelling.

Table 11 summarises the mean accuracy rates for locative (based on the production task) from the Polish heritage children across both time points for Accuracy (RoE was only measured at Time 1). As can be seen from the Table 11, there is a tendency for the mean accuracy for locative to be higher the stronger the social network, i.e. low Polish network results in the lowest mean accuracy of 93% with medium Polish network mean accuracy for locative somewhat higher at 97% and finally high Polish network with the highest mean accuracy for locative at 99%. This means that, at least descriptively, higher social networks seem to correspond with higher accuracy.

Table 11 Summary means for accuracy for locative and social networks and RoE in Polish heritage children

Social network	*meanAcc*	*meanRoE*
Low Polish	0.9366197	47.76%
Medium Polish	0.9779780	63.27%
High Polish	0.996146	79.08%

As can be seen from Table 12 the impact of social networks seems to be further enhanced as far as heritage children's performance over time is concerned, i.e. from the start of Reception to the end of Reception with children who remained in the high Polish network going from 99% to 100% mean accuracy for locative case in the production task; similarly with medium Polish network increasing from 97% to 98% as opposed to low Polish network heritage children and their mean accuracy for locative decreasing from 97% to 91%.

Table 12 Summary means for accuracy and social networks at both time points in Polish heritage children

Social network	*Time_Point*	*meanAcc*	*meanRoE*
Low Polish	Start of Reception	0.9738956	47.76%
Low Polish	End of Reception	0.9128205	----------
Medium Polish	Start of Reception	0.9757085	63.27%
Medium Polish	End of Reception	0.9801980	-------
High Polish	Start of Reception	0.9955157	79.08%
High Polish	End of Reception	1.0000000	--------

Following the descriptive analysis, social networks were analysed using mixed linear models in R. When looking at the influence of social networks at Time 1 and Time 2, no significant effect was found in modelling (in either production or AJT). However, these models included two variables that potentially correlated: RoE – richness of exposure and social networks. Heritage children who were in the High Polish social network group also had a high RoE, and heritage children who were in the Low Polish social network group had low RoE). It is therefore possible that RoE is actually capturing the social network variable, however, it is worth remembering that social networks would just be one part of RoE. Despite the fact that social network was not significant in the final model, it was significant in the initial univariate models. Compared to participants in the High Polish network group, participants in the Low Polish social network group obtained significantly lower accuracy scores (β =–2.80, SE = 0.89, z = –3.15, p < .01) in the production task and the Medium Polish social network results are also marginally less than the high social network results (β =–1.55, SE = 0.91, z =–1.70, p = .09). However, when RoE was inserted, social network became non-significant suggesting a potential confound. Given that correlated variables in the same model is problematic (Knop *et al.*, 2023), the effect of social network on the dependent variable should not be disregarded entirely.

In conclusion, even though the social networks show no significance in the statistical analysis, its effect could have been encapsulated in RoE instead and descriptively it is clear that they contribute to higher accuracy. Below, I conduct heritage-only longitudinal analyses of proficiency, which as previously mentioned, also seems to contribute to higher accuracy in the AJT.

6.2.4 The role of proficiency

The Polish heritage children as well as monolingual Polish children had their language proficiency tested by means of a picture description task (see previous chapter) and Table 13 below lists the Polish heritage children's ages and proficiency rates in English and Polish as

measured by their speech rate (words per minute (wpm)) at the start and at the end of Reception (their first year at school). This comparison of proficiency levels in Polish at the start/end of Reception reveals that speech rate in Polish went up for 50% of the Polish heritage children at the end of their first year in school; remained the same in just one child (3%) and went down in 47% of the Polish heritage children. It shows a balanced split in this group of participants. However, when comparing the speech rate in English in the same children at the start and at the end of Reception there is a noticeable difference at the end of first year of school with 90% of children showing increase in their use of English words; only 1 child remaining at the same level, whilst 1 child's speech rate went down.

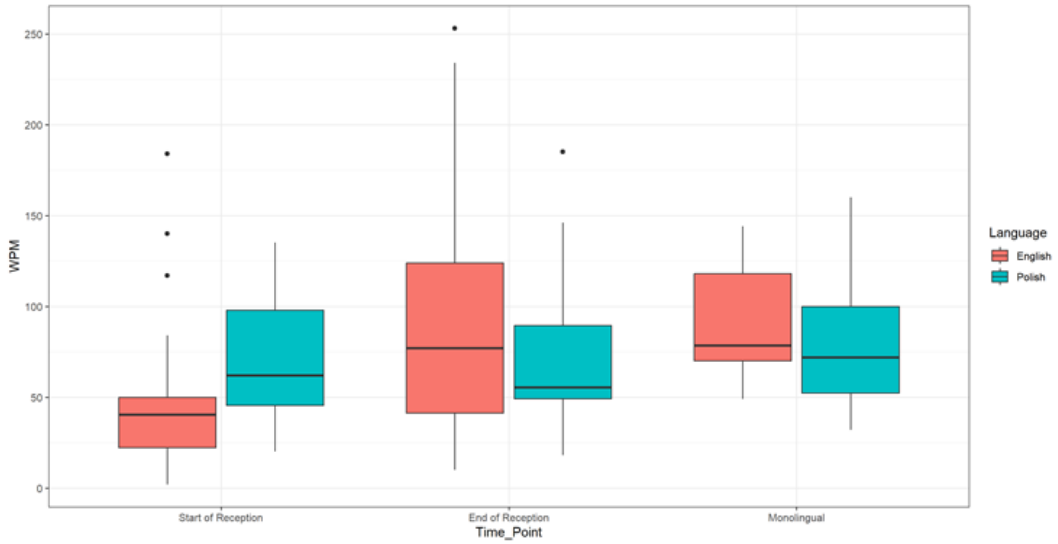
Table 13 An overview of age and proficiency information about the Polish heritage children

Participant ID	Age at time of testing (years)	Polish speech rate Start of Reception (wpm)	Polish speech rate End of Reception (wpm)	English speech rate Start of Reception (wpm)	English speech rate End of Reception (wpm)
P1	5	20	18	50	79
P2	4;5	41	66	47	67
P3	5	135	185	184	253
P4	4;8	77	49	72	83
P5	4;1	127	57	50	109
P6	4;8	57	35	17	53
P7	4;6	38	50	26	30
P8	4;3	120	60	20	38
P9	5	130	54	36	155
P10	4;4	40	49	10	32
P11	5	78	82	140	234
P12	4;3	56	114	37	81
P13	5;1	99	146	84	91
P14	4;5	78	29	4	41
P15	4;5	48	140	24	31
P16	4;5	40	74	50	138
P17	4;5	102	142	48	75
P18	4;6	95	46	117	136
P19	4;7	122	52	52	129
P20	4;5	45	50	19	42
P21	4;2	47	32	7	30
P22	5	84	52	38	93
P23	4;2	32	28	2	10
P24	4;5	61	100	58	53
P25	4;4	63	56	48	47
P26	4;8	90	55	48	105
P27	4;3	58	122	35	144
P28	4;2	115	79	22	40
P29	5;1	41	92	43	156
P30	4;3	54	55	33	50
MEAN	**4.59**	**73.1**	**72.3**	**47.3**	**87.5**
RANGE	**4;1-5;1**	**20-135**	**18-185**	**2-184**	**10-253**
SD	**0.30**	**33.3**	**40.7**	**39.5**	**59.5**

Table 14 illustrates the similarity of speech rate results at the start and at the end of Reception in heritage children in Polish and shows that they are not less proficient in Polish than the monolingual children even at the end of Reception. However, it also shows a great contrast in terms of heritage children's speech rate in English at the start and at the end of first year in school and demonstrates how quickly it went up in a space of a year though the level of in-group variation remains high. It is striking how their speech rate is comparable at the end of Reception for Polish heritage children (87.5wpm), whilst the mean speech rate of 88.25wpm is what English monolingual children display at the beginning of their first year in school.

In sum, even though it appears that at the beginning of their first year at school Polish heritage children display a much lower mean speech rate in English (47.3wpm), they 'catch up' at the end of the school year and display similar speech rate levels as their English counterparts (see Table 20 in the Appendix D). As far as the mean speech rate in Polish (see Table 21 in the Appendix D), monolingual children have a marginally higher speech rate (77.9wpm) than the heritage children (73.1wpm), but both groups show similar levels of variation within their respective groups, which is also confirmed in highly comparable SD results (heritage children: 33.3 and monolingual children: 33.4).

Table 14 Comparison of WPM (words per minute) in child heritage speakers and monolingual speakers.



Heritage only linear mixed effects models also confirmed that the difference in proficiency between start and end of Reception is highly significant averaging across both languages (β = 19.83, SE = 5.2, t = 3.81, p < .0001) (see Fig.11 for effects plots and Fig.12 for model summary). Overall the heritage children's proficiency is lower in English, but not significantly lower (β = –

5.13, SE = 6.57, t = –0.78, p = 0.44) however, the increase in proficiency in English is significantly greater than in Polish (β = 41.33, SE = 10.4, t = 3.97, p < .0001). On the whole, child heritage speakers' Polish does not improve where we could have seen an improvement, but for some children there has been a decline and for others maintenance of the proficiency overall whereas proficiency in English has clearly increased. The overarching research question asks how changes in input and exposure to the majority language affect heritage language acquisition in the first year of school. If we consider Polish heritage children's proficiency results in both minority (Polish) and majority (English) language, then we will notice that whilst their Polish on average is stable at Time 2, their English proficiency increases in as many as 90% of the children. Subsequently, these proficiency results may also be a window into understanding how language dominance can potentially affect heritage language acquisition.

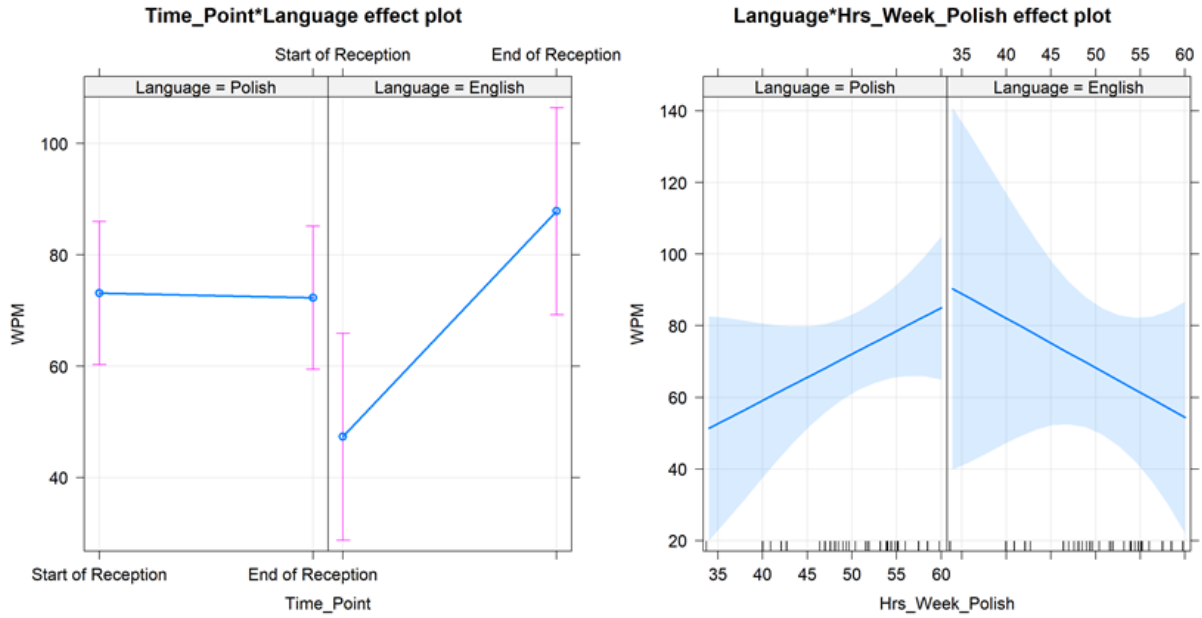


Figure 11 Time point language effect plot

Fixed Effects	Estimate	SE	df	t value	p value	Significance
(Intercept)	70.15	6.39	28	10.98	< .0001	***
Time_PointEnd of Reception	19.83	5.2	58	3.81	< .0001	***
LanguageEnglish	-5.13	6.57	28	-0.78	0.441	n.s.
scale(Hrs_Week_Polish)	-0.26	6.42	28	-0.04	0.968	n.s.
Time_PointEnd of Reception:LanguageEnglish	41.33	10.4	58	3.97	< .0001	***
LanguageEnglish:scale(Hrs_Week_Polish)	-15.94	6.6	28	-2.42	0.022	*
Significance levels: *** p < .001, ** p < .01, * p < .05, . p < .1						
Formula: WPM ~ Time_Point * Language + Language * scale(Hrs_Week_Polish) + (1 + Language | Participant_ID)						
No. of observations: 120						
Random Intercepts: Participant_ID (30, Var = 1022.11, SD = 31.97)						
Random Slopes: LanguageEnglish by Participant_ID (Var = 482.15, SD = 21.96)						

Figure 12 Statistical summary of proficiency

Turning to the parents, in Tables 22 and 23 (see Appendix D) despite the fact that parents' language is not statistically different to the language of monolingual adults in Poland based on the case accuracy results, their grammar test results show a higher degree of variation (i.e. 85-100) compared to monolingual adults (i.e. 95-100). Some (though not all) of the lower accuracy scores in Polish heritage children are associated descriptively with the lower grammar test results of their mothers (e.g. 85, 89, 91). However, monolingual adults in Poland also show variation in proficiency results.

To sum up, looking into the proficiency in this study helped to notice how rapidly it progresses in English for Polish heritage children, but also how it stalls in Polish, which constitutes a possible window into the start of majority language dominance. At the same time, it also confirms that heritage parents' mother tongue remains in line with the monolingual Polish adults in Poland and that there is some variability in their proficiency test results similarly to the monolingual adults in Poland.

6.2.5 Interim summary

In summary, the results show that although descriptively Polish heritage children differ from Polish monolingual children, that difference is not statistically significant and they are within monolingual range. Nonetheless, heritage-only analyses in both tasks shows that for one of the cases (i.e. locative), there is a significant decrease in accuracy in both the production and AJT tasks among the heritage speakers.

It is also clear that there is individual variation in the data: only certain children are behaving differently from the controls rather than the sample as a whole. Therefore, a further analysis of the Polish heritage children and a closer look at the individuals within that group will follow. Below I provide a closer look at the individuals within that group who do not perform at 100% comparing them with those who do and provide a detailed background of these individuals with a view of observing some of the most prevalent characteristics. Rothman *et al*., (2023: 7) explain that "understanding heritage speaker-to-heritage speaker individual variation is more equitable than comparing them to monolinguals because we can more meaningfully probe into variables that conspire to result in documented variation itself" and what is more, "while group differences are meaningful, especially for specific questions, understanding the potentially clandestine individual variation hidden within aggregated comparisons is at least equally important and useful for other theoretical questions" (Luk & Rothman, 2022: 1).

6.3 Analysis of the Polish heritage children's individual differences

First, I present a summary of the individuals' results for the production task and AJT as well as a summary of results from the BiLEC questionnaire. Furthermore, I include a detailed description of Polish heritage children's friendships at school measuring their orientation towards particular social networks. Finally, I analyse the individual results from Polish heritage children and provide a summary.

6.3.1 Accuracy results of individual Polish heritage children

Table 15 summarises the accuracy rates[8] in the production task amongst Polish heritage children. At the start of Reception, out of the 30 children, 11 (37%) show 100% accuracy on this task across 3 different cases (nominative, genitive, locative). Looking at the 3 cases separately, it as can be seen immediately there are no differences in the accuracy of nominative case, neither at the start nor at the end of Reception. The same applies to genitive (only tested in possessive function) at the start of the school year, which has 100% accuracy. However, at the end of Reception, although 80% (24) of children retain the 100% accuracy, the other 20% (6) show some changes in the use of this case. With regards to locative, 57% (17) of children show 100% accuracy at the start of the Reception and out of the 17 children 11 still show 100% at the end of the year. 6 children start showing changes at the end of the year despite 100% accuracy at the start. The remaining 43% (13) show reduced accuracy in the use of locative at both times of the study (1 and 2). What is more, at the end of the school year (Time 2) all of these 13 children show a reduced accuracy meaning they show more changes at the end of Reception. It is clear that nominative is the least difficult case where children display target-like behaviour. With genitive (in its possessive function) I predicted that they would similarly display target-like behaviour based on the fact that English also exhibits morphophonologically marked case (i.e. *'s*) and shares an underlying feature valuation for the genitive, however it appears that some of the children showed some problems with this case, but only at the end of school. Those children replace the genitive with a nominative though only in a very limited number of examples. Finally, the locative case as predicted, turned out to be the most vulnerable in the heritage children's grammars. Those children who showed problems with this case replaced it either with nominative or accusative, which will be discussed in more detail in the next chapter. To sum up, these differences are even more pronounced when we look at the Polish heritage children individually, which deserves a closer investigation.

[8] displaying the number of tokens in brackets

Table 15 Accuracy rates in the production task for Polish heritage children

Participant ID	*Nom Accuracy % Start of Reception*	*Nom Accuracy % End of Reception*	*Gen Accuracy % Start of Reception*	*Gen Accuracy % End of Reception*	*Loc Accuracy % Start of Reception*	*Loc Accuracy % End of Reception*
P1	100 (26)	100 (19)	100 (5)	83.33 (6)	70 (10)	43.75 (16)
P2	100 (17)	100 (21)	100 (5)	85.71 (7)	66.66 (9)	64.28 (14)
P3	100 (21)	100 (39)	100 (5)	100 (8)	81.81 (11)	62.50 (7)
P4	100 (26)	100 (29)	100 (8)	87.50 (8)	81.81 (10)	73.33 (15)
P5	100 (39)	100 (34)	100 (5)	100 (6)	100 (9)	100 (16)
P6	100 (27)	100 (29)	100 (9)	100 (5)	100 (12)	87.50 (18)
P7	100 (45)	100 (26)	100 (5)	100 (5)	84.61 (13)	71.42 (5)
P8	100 (24)	100 (22)	100 (5)	85.71 (7)	83.33 (6)	71.42 (14)
P9	100 (54)	100 (23)	100 (5)	100 (5)	90.90 (11)	52.94 (17)
P10	100 (18)	100 (15)	100 (5)	100 (5)	91.66 (12)	75 (8)
P11	100 (32)	100 (24)	100 (5)	100 (6)	92.85 (14)	90 (20)
P12	100 (25)	100 (25)	100 (5)	100 (10)	75 (11)	69.23 (13)
P13	100 (49)	100 (38)	100 (12)	100 (5)	100 (15)	100 (5)
P14	100 (11)	100 (25)	100 (5)	100 (7)	100 (7)	100 (8)
P15	100 (25)	100 (25)	100 (11)	100 (7)	100 (8)	100 (14)
P16	100 (44)	100 (24)	100 (8)	100 (5)	100 (10)	100 (17)
P17	100 (29)	100 (15)	100 (5)	100 (5)	100 (9)	100 (13)
P18	100 (39)	100 (28)	100 (7)	100 (8)	92.30 (13)	82.35 (17)
P19	100 (32)	100 (26)	100 (8)	100 (7)	100 (10)	92.30 (14)
P20	100 (33)	100 (21)	100 (7)	100 (5)	81.25 (16)	46.66 (15)
P21	100 (13)	100 (15)	100 (5)	83.33 (6)	100 (5)	71.42 (10)
P22	100 (32)	100 (36)	100 (6)	83.33 (6)	75 (16)	66.66 (15)
P23	100 (25)	100 (17)	100 (8)	100 (5)	100 (6)	66.66 (7)
P24	100 (29)	100 (59)	100 (7)	100 (7)	100 (12)	87.50 (16)
P25	100 (31)	100 (22)	100 (6)	100 (5)	100 (17)	100 (8)
P26	100 (24)	100 (28)	100 (7)	100 (7)	100 (11)	100 (15)
P27	100 (32)	100 (28)	100 (7)	100 (10)	100 (10)	100 (8)
P28	100 (30)	100 (16)	100 (11)	100 (5)	100 (12)	100 (12)
P29	100 (34)	100 (32)	100 (8)	100 (8)	100 (8)	66.66 (9)
P30	100 (32)	100 (27)	100 (8)	100 (5)	100 (12)	100 (7)
MEAN	**100**	**100**	**100**	**96.85**	**91.74**	**80.69**
RANGE	**100-100**	**100-100**	**100-100**	**83.33-100**	**66.66-100**	**43.75-100**
SD	**0**	**0**	**0**	**17.48**	**27.56**	**39.52**

Table 16 shows the accuracy rates in the AJT amongst Polish heritage children (number in brackets shows a number of examples out of 8 that the participants rated as incorrect). Similarly to the production task, Polish heritage children show a 100% accuracy in the nominative case in both Time 1 and Time 2 of the study and genitive case (in possessive

function) in Time 1. However, in Time 2 contrary to my predictions about genitive case (due to the morpheme *'s*), I observed decreased accuracy in 23% (7) of the heritage speakers, whereas 77% (23) of the heritage children remained at 100%. Those children who showed problems with this case accepted the nominative in place of genitive. The accuracy rates are slightly lower as far as locative is concerned at the beginning of the school year with 37% (11) of children showing reduced accuracy which increased to 50% (15) children at the end of the year. Those children who showed problems with this case accepted either nominative or accusative in place of locative. By-item analyses did not reveal that the difficulty encountered by the group was due to any specific item but one (that caused difficulties for 9 out of 15 children), decreasing the likelihood of a task-effect. The item that caused difficulties included accepting the accusative as grammatical in place of a locative, which involved a consonant change (*na bułkę – na bułce,* i.e. c for k) and from the literature above we know that cases expressed with a higher number of phonological alternations are more difficult to acquire so this could serve as a possible explanation why this example caused problems to more children. Another sentence that caused problems with inflection of the locative case included a preposition '*przy*', which according to Łuczyński (2004) is less frequent and points to the role of frequency. Some of the heritage speakers used dimunitives.

Table 16 Accuracy rates in the acceptability judgement task for Polish heritage children

Participant ID	Nom Accuracy % Start of Reception	Nom Accuracy % End of Reception	Gen Accuracy % Start of Reception	Gen Accuracy % End of Reception	Loc Accuracy % Start of Reception	Loc Accuracy % End of Reception
P1	100	100	100	87.5 (1)	87.5 (1)	75 (2)
P2	100	100	100	62.5 (3)	87.5 (1)	75 (2)
P3	100	100	100	87.5 (1)	87.5 (1)	87.5 (1)
P4	100	100	100	100	87.5 (1)	87.5 (1)
P5	100	100	100	100	100	100
P6	100	100	100	100	100	100
P7	100	100	100	100	87.5 (1)	87.5 (1)
P8	100	100	100	87.5 (1)	87.5 (1)	75 (2)
P9	100	100	100	100	100	75 (2)
P10	100	100	100	75 (2)	87.5 (1)	50 (4)
P11	100	100	100	100	100	87.5 (1)
P12	100	100	100	100	87.5 (1)	87.5 (1)
P13	100	100	100	100	100	100
P14	100	100	100	100	100	87.5 (1)
P15	100	100	100	100	100	100
P16	100	100	100	100	100	100
P17	100	100	100	100	100	100
P18	100	100	100	100	100	87.5 (1)
P19	100	100	100	100	100	100
P20	100	100	100	100	87.5 (1)	87.5 (1)
P21	100	100	100	87.5 (1)	87.5 (1)	62.5 (3)
P22	100	100	100	87.5 (1)	87.5 (1)	75 (2)
P23	100	100	100	100	100	100
P24	100	100	100	100	100	100
P25	100	100	100	100	100	100
P26	100	100	100	100	100	100
P27	100	100	100	100	100	100
P28	100	100	100	100	100	100

P29	100	100	100	100	100	100
P30	100	100	100	100	100	100
MEAN	**100**	**100**	**100**	**95.83**	**95.41**	**89.58**
RANGE	**100-100**	**100-100**	**100-100**	**62.5-100**	**87.5-100**	**50-100**
SD	**0**	**0**	**0**	**20.02**	**20.95**	**30.61**

Next, in the Section 6.3.2, I look individually at the participants and consider whether any of the variables amount to a potential source of difference that may be observed within the Polish heritage children and examine their role in explaining why heritage speakers diverge from the baseline grammar or not.

6.3.2 Analysis of individual results from Polish heritage children

In this section, I focus on children's individual results taking into account their individual characteristics presented in more detail in Table 24, 25, 26 (see Appendix D) as well as Table 17 below. The data in the latter table show individual variation among the heritage children in their acquisition of case. This is not unusual for heritage speakers (Montrul, 2016; Polinsky, 2018) and I expected to find varied performance, however it is now important to examine what factors, if any, correlate or explain these results and if any of the variables might help understand their accuracy.

Table 17 Polish heritage children's social networks at the start and at the end of their first year in school

	Start of Reception	End of Reception
P1	Low Polish	Low Polish
P2	Medium Polish	Low Polish
P3	Medium Polish	Low Polish
P4	Low Polish	Low Polish
P5	High Polish	Medium Polish
P6	Low Polish	Low Polish
P7	High Polish	Low Polish
P8	Medium Polish	Low Polish
P9	Medium Polish	Low Polish
P10	Medium Polish	Low Polish
P11	Low Polish	Low Polish
P12	Low Polish	Low Polish
P13	High Polish	Medium Polish
P14	High Polish	High Polish
P15	Medium Polish	Medium Polish
P16	Medium Polish	Medium Polish
P17	High Polish	Medium Polish
P18	Medium Polish	Medium Polish
P19	Medium Polish	Medium Polish
P20	Medium Polish	Low Polish
P21	Medium Polish	Medium Polish
P22	Low Polish	Low Polish
P23	High Polish	Medium Polish
P24	Low Polish	Low Polish
P25	High Polish	Medium Polish
P26	High Polish	Medium Polish
P27	Medium Polish	Medium Polish
P28	High Polish	High Polish
P29	Low Polish	Low Polish

P30	Low Polish	Medium Polish

Before I proceed with the analysis of the individual results, I present a summary of the descriptive results of the BiLEC questionnaire regarding the tested variables in Table 18 for Polish heritage children in this study.

Table 18 Summary of BiLEC questionnaire results at Time 1

	Mean (SD)	***Range***
Age of exposure to English (years)	2.16 (0.76)	0.84-3.47
Hours a week Polish	50.49 (6.03)	33.7-59.8
Hours a week English	37.77 (3.94)	32.5-45.6
Average Polish spoken (%)	86 (10)	57-100
Average English spoken (%)	13 (11)	0-43
Richness of exposure to Polish (%)	59 (18)	31-100
Richness of exposure to English (%)	40 (18)	0-90
Cumulative LoE to Polish in years	3.21 (0.53)	2.25-3.93
Cumulative LoE to English in years	0.79 (0.52)	0.07- 1.95
Average exposure to Polish per week (home/school/ extra/holidays etc.) (%)	60 (10)	42-74
Average exposure to English per week (home/school/ extra/holidays etc.) (%)	40 (10)	26-53

From the table above, it is clear that at the start of the school year almost every variable is characterised by a wide range. This means that there is a large degree of variation between these Polish heritage speakers confirming that it is worth looking at this data individually. For example, richness of exposure to English range stretches between 0 to 90% meaning that some children have a very limited access to various sources of English while others are almost completely immersed in this societal language. Similarly, while some children would be exposed to English at around 9 months others would only experience this exposure at the age of 3;5 and on average, Polish heritage children in this study were first exposed to English around

the age of 2. I have included this variable in the model to test for potential age effects, however this variable had no effect in this data and has not been statistically significant but similarly to other variables, it will be analysed individually below. In summary, at the beginning of the year Polish child heritage speakers spend a balanced number of hours hearing Polish and English; they speak more Polish than they speak English; their richness of exposure to Polish is higher than to English but only slightly; their cumulative length of exposure to Polish is considerably higher than to English; and their average exposure to Polish a week is fairly similar to their average exposure to English a week. As presented earlier in this chapter, the single variable that proved significant was richness of exposure ratio (RoE) between Polish and English which I also take into account below.

I begin with an analysis of the group of Polish heritage children who showed most reduced accuracy and focus on their accuracy first. Participant 1 is an example of one of the most dramatic changes in accuracy of locative in the production task as his accuracy rate being already low at Time 1 (70%) decreases by nearly half as much (43.75%) by Time 2 and replacements or uses of incorrect forms where the locative would be expected triples. His accuracy in the AJT is also lower at Time 1 (87.5%) and decreases to 75% at Time 2. What is more, with the genitive although he displays 100% at Time 1, this does decrease again at Time 2 in the production task and similarly starts well at Time 1 in the AJT, but decreases at Time 2 though not as dramatically as with the locative. Participant 1 is the younger sibling and his friendship network remained Low Polish both at the start and at the end of his first year in school. He started pre-school when he was 1.5 years old and on average he spends more hours a week hearing English than Polish though 2/3 of the time he speaks Polish. Looking closer at the RoE English dominates here (60%). Average exposure to both Polish and English per week (home/school/extra-curriculars/holidays/etc.) looks very similar with English at 52%. Altogether cumulative length of exposure (LoE) in years to Polish is higher (2.46) than in English (1.54). His speech rate in Polish was much lower compared to other heritage children whilst his English speech rate was higher than the Polish speech rate. Additionally, he has higher RoE to English (60%) than to Polish (40%). When put together, his language profile above seems to explain his low accuracy results.

Participant 2, interestingly, shows the lowest locative accuracy in the production task at Time 1 (66.66%), however his decrease is not as dramatic compared with Participant 1 and in fact, very minimal (64.28%). He displays identical decrease in locative in the AJT as Participant 1. Participant 2 is an only child whose social network group classified as Medium Polish at the start of school to Low Polish at the end of it. He was exposed to English fairly early (in nursery and then pre-school) when he was just over 9 months old. He hears more Polish a week (46.4 hours) than English (42.7 hours), but again these numbers are quite close. His parents report

that he speaks more Polish than English. His cumulative LoE to Polish is only slightly higher than his LoE to English. Though similar in two languages, his average exposure to English is slightly higher (53%). This is comparable with his results regarding the RoE, but English is even higher here at 59%. His speech rate is alike in two languages, but it is still fairly low in comparison with a mean speech rate for the whole group. Likewise, when put together, some of the variables in his language profile above seems to explain his low accuracy results.

With regards to Participant 3, her locative accuracy in the production task is not as low compared to the previous two participants at Time 1 (81.81%), but it does decrease at Time 2 (62.50%). What is intriguing, is that her genitive in the production task remains 100% accurate at both time points, whilst in the AJT it decreases from 100% at Time 1 to 87.50% at Time 2. Considering that the grammaticality variable turned out to be highly significant for heritage speakers as a group, it is possible that this had an effect with regards to genitive. Participant 3 is the oldest sibling and her social network classified as Medium Polish at the start of the school, but later changed to Low Polish at the end of Reception. She was first exposed to English (at a childminder) when she was 1.58 years old. She hears a fairly similar amount of Polish and English a week with a slight dominance of Polish and similarly to previous children, she speaks more Polish than English. Even though her cumulative LoE to Polish (3.21) is much higher than to English (0.79), her RoE to Polish is substantially lower at 37% as opposed to English at 63%. The average exposure to both languages is also fairly balanced. Her speech rate in Polish is one of the highest in the group and it is very similar to her English speech rate. One of the variables in her language profile i.e. RoE, when put together with low accuracy, seems particularly low.

Participant 4 shows a slight decrease in genitive accuracy both in the production task and AJT, though change is more prominent with locative in the production task which decreases from Time 1 (81.81%) to 73.33% at Time 2. Interestingly, with regards to locative accuracy in the AJT, the accuracy percentage remains the same at both time points (87.5%). Participant 4 is younger than her sibling and her social network remains classified as Low Polish both at the beginning of the school and at the end. She was first exposed to English nursery at the age of 2 and she hears more Polish a week than English, but only slightly. She speaks more Polish than English in the week, but the RoE to Polish is much lower at 34% than to English at 66%. As far as average exposure to Polish and English, it is also similar in both languages, but slightly higher in English. Her Polish speech rate is slightly above the mean and it is similar in English, but the Polish speech rate goes down at the end of the school year. Her RoE is also very low and her exposure to English is higher when put together with the lower accuracy rate.

Participant 7 retains 100% accuracy with regards to genitive in both tasks, but her locative accuracy is already lower at Time 1 (84.61%) and decreases further at Time 2 (71.42).

Interestingly, although she produces the same amount of replacements or uses of incorrect forms where the locative would be expected, her accuracy is lower as she produces less locatives altogether. Participant 7 is an only child and went from a High Polish network at the beginning of school to a Low Polish network at the end of Reception. She was exposed to English fairly late comparing to others (at the age of 3.47) and she hears a lot of Polish a week and speaks more Polish than English, but her RoE is substantially higher in English (69%) than in Polish (31%). Average exposure to both languages is also fairly similar. Her Polish speech rate is much lower than the mean (38wpm) though it increases a little bit at the end of the year, whilst her English speech rate is lower (26wpm). Likewise, when put together, some of the variables in her language profile above seems to explain his low locative accuracy results and what is interesting, although her social network is very Polish oriented at the start, at Time 2 it is quite the opposite.

Participant 8 displays a decrease in genitive accuracy at Time 2 in both tasks from 100% at Time 1. With regards to locative accuracy in the production task, it also decreases from Time 1 (83.33%) to 71.42% at Time 2. Participant 8 is the oldest sibling who went from Medium Polish network at the start of Reception to a Low Polish network at the end of school. He started preschool at an earlier age (1.5 years) than average (2.16). His parents report that he speaks more Polish and hardly any English. Both his average exposure and RoE to English are slightly higher than to Polish. His Polish speech rate is higher than English, but then it goes down at the end of the year. Again, in in this example Polish social network seems to weaken at Time 2 and so does the speech rate.

Participant 12 retains 100% accuracy with regards to genitive in both tasks, but her locative accuracy is already low at Time 1 (75%) and decreases further at Time 2 (69.23%). Her genitive accuracy is low at Time 1 (87.5%) and remains unchanged at Time 2 (87.5%). Participant 12 is an only child and her friendship network remained as Low Polish both at the start and at the end of Reception. She hears a fairly balanced amount of English and Polish per week, but she speaks substantially more Polish than English. Her RoE to both languages is also fairly balanced although somewhat higher in English at 57%. Her average exposure to both languages is also fairly balanced. Her Polish speech rate is higher than English, but still below the mean for this group. Out of all the variables, it is her friendship network that includes no Polish friends at Time 1 and remains unchanged at Time 2.

Participant 20 again retains 100% accuracy with regards to genitive in both tasks, but her locative accuracy decreases dramatically from 81.25% at Time 1 to 46.66% at Time 2, which is one of the lowest accuracy scores in this group. Interestingly, her locative in the AJT is low at Time 1 (87.5%) and remains unchanged at Time 2 (87.5%) compared to the more profound

change in the production task. Participant 20 is the younger of the sibling and she went from a Medium Polish network at the beginning of the school to a Low Polish network at the end of the school. She started pre-school at 2.59 and she hears and speaks more Polish than English a week. Her average exposure to English is higher (58%) and so is her RoE to English (57%). Her Polish speech rate is also lower than the mean for this group (45wpm). Again, in in this example Polish social network seems to weaken at Time 2 and so does the speech rate.

Participant 22 displays a decrease in genitive accuracy at Time 2 in both tasks from 100% at Time 1. With regards to locative accuracy in the production task, it also decreases from Time 1 (75%) to 66.66% at Time 2. Participant 22 is a younger of the sibling and his friendship network remained as Low Polish both at the start and at the end of Reception. He started pre-school at 2.5 and he hears a similar amount of English and Polish a week though he speaks more Polish. His average exposure to Polish and English is balanced, but his RoE is lower in Polish (44%) than in English. His Polish speech rate is higher than the English one, but it does go down at the end of school whilst the English speech rate goes up. What is interesting, his friendship network at both time points does not include any Polish friends.

Considering the second group of Polish heritage children who had lower accuracy, but performed somewhat better than the above group (cut offs for this group are in the range of 85 % to 99% accuracy, for the above group below 85% accuracy and for the final group 100% accuracy) and includes participant 6, 9, 10, 11, 18, 19, 21, 23, 24 and 29, there are some common trends displayed by these children. Most of these participants are only children or older siblings. Half of them had some Polish friends or none at the beginning of the year (Medium Polish/Low Polish) but then had none at the end (Low Polish), whilst the other half had some Polish friends at the beginning of the year (Medium Polish) and kept them at the end (Medium Polish). Almost all of them would hear and speak more Polish than English. Their average exposure to Polish would be slightly higher than the group above. As far as their RoE to Polish and English it would also be balanced but somewhat higher than to English. When it comes to Polish speech rate, half of the group displays higher speech rate than the mean group rate and half of the group displays lower speech rate. Participant 21 is an only child who has some Polish friends at the beginning of the school and some at the end. His age of exposure to English is at 2.5 and he hears and speaks more Polish a week than English, but his RoE is slightly higher in Polish (54%) than in English (46%). His Polish speech rate is below the mean and it decreases further at the end of the first year at school. Participant 23 is a younger of the sibling and he had more Polish friends at the beginning of school, but less at the end. He started pre-school at 3 and he hears and speaks more Polish than English. His exposure to Polish is higher (60%) than to English and so is his RoE (54%) than to English. His Polish speech rate is well below the mean and his English speech rate is also very low.

Finally, the last group of the participants who displayed monolingual-like accuracy across both tasks includes participant 5, 13, 14, 15, 16, 17, 25, 26, 27, 28 and 30. Most of the participants are also only children or older siblings. Most of them had a higher number of Polish friends at the start of Reception even though this number decreased at the end of the school year. Most of them went to pre-school at around the age of 2.5. As far as their Polish speech rate, half of the group has higher speech rate than the mean and the remaining half has lower speech rate in Polish than the mean. Almost all of them hear more Polish and speak more Polish in the week than English. What is interesting, their RoE to Polish is always higher than to English and it is higher than the above two groups with an average of 80%. Equally, average exposure in the week to Polish is always higher and higher still than the other participants in the two above groups.

In conclusion, the first group, who showed most reduced accuracy in the production task, is generally characterised by higher RoE to English as well as higher average (current) exposure per week to English. For this group, the children's speech rate is also generally lower compared to the other groups and their friendship groups are either Low Polish at the start and at the end of Reception or they go from Medium Polish to Low Polish. The second group has somewhat higher average exposure and RoE to Polish than the first group, their speech rates are generally slightly higher than the previous groups and their friendship networks also seem slightly more Polish-oriented. Finally, the third group which includes the highest performers (all with 100% accuracy) is characterised by a much higher average exposure to Polish per week and a much higher RoE to Polish, generally stronger Polish friendship groups and highest speech rate in Polish.

6.4 Summary

As part of this chapter, I have presented and analysed the results of the production task and the acceptability judgement task. It appears that when compared with the monolingual Polish children, Polish heritage children show no changes when compared to the baseline based on the data collected from the tasks. However, heritage speaker scores also demonstrated a high degree of heterogeneity. It is clear that individually some of the Polish heritage children diverge from the monolingual children in Poland, some show reduced accuracy later at the end of Reception whilst others mirror the monolingual children's 100% accuracy across all three cases. In the light of the original hypotheses, in the first group of children's problems with case are visible from the start, pointing to incomplete acquisition, and in some children at the end of the year, indicating onset of attrition. What is more, the accuracy rate for some children who show incomplete acquisition at the start with locative decreases further as the year progresses, which points to both incomplete acquisition and attrition for this case; however, it must be remembered that this is only selective as does not apply to all of the tested cases. Although

there is a significant change in accuracy over time this is only applicable to the Polish heritage children as a group in the production task and AJT and only to one of the cases, namely locative.

Having analysed the role of variables, it was demonstrated that RoE ratio plays a significant role for Polish heritage children as a group and this study supplies significant evidence that input quality (richness of exposure) is a predominant explanatory factor for case acquisition by Polish heritage children. In the analysis of the individual performance of the participants low RoE to Polish (and therefore high exposure to English) was associated with lower accuracy scores, whereas the highest RoE Polish scores (i.e. lowest exposure to English scores) were associated with the highest performing Polish heritage children. What we do know about the Polish heritage children who achieved the highest accuracy throughout the first year at school (100%) is that they are characterised by a much higher average exposure to Polish per week and a much higher RoE to Polish, generally stronger Polish friendship groups and highest speech rate in Polish.

Additionally, the evidence collected confirms a number of expected behaviours regarding the higher proficiency contributing to higher accuracy scores and generally proficiency in English language improving for the Polish heritage children over the course of the year at majority language school. Moreover, parents perform at top level in line with the monolingual adults in Poland.

6.5 Follow-up results from Time 3

To analyse whether the observed linguistic patterning persisted (though this was not part of the original plan), I followed up 15 out of 30 Polish heritage children at Time 3, i.e. two years after they started school (end of Year 1 being the next year after Reception). Out of the 30 children, I followed three groups, i.e. 5 children from the group who were best performers (labelled in green) as highlighted in the individual analyses above, 5 children who did less well than the first group (labelled in amber) and 5 children from the group, which had the lowest case accuracy (labelled in red) - these coloured measures correspond to their case accuracy (see footnote). The labels that I am using are for locative production task specifically here. I am focused on this task/case because it presented most challenge/most deviance from monolingual rates. I include the genitive and WPM results for additional reference. I present their results from Time 3 in Table 19 regarding genitive and locative accuracy in the production task as well as AJT and their proficiency results, i.e. wpm (words per minute) count in English and in Polish as well as data regarding their social networks at Time 3. I have split the results in this table into three different groups because each of these groups shares some common characteristics. It is immediately apparent that the children who were the highest performers at Time 1 and remained the highest at Time 2, have also achieved the highest accuracy at Time 3. Their

proficiency in both Polish and English increased and their social networks either remained High or Medium or changed to High or Medium at Time 3.

Table 19 Follow-up results from Time 3 regarding case accuracy, proficiency and social networks

Participant ID	*Gen Acc Time 1*	*Gen Acc Time 2*	*Gen Acc Time 3*	*Loc Acc Time 1*	*Loc Acc Time 2*	*Loc Acc Time 3*	*WPM Time 1/2/3 POLISH*	*WPM Time 1/2/3 ENGLISH*	*AJT GEN Time 1/2/3*	*AJT IN LOC Time 1/2/3*	*Social network at Time 1/2/3*
BEST PERFORMERS REMAINED STABLE											
P5*[9]	100 (5)	100 (6)	100 (8)	100 (9)	100 (16)	100 (19)	127/57/63	50/109/107	100/100/100	100/100/100	High/ Medium/ High
P13*	100 (12)	100 (5)	100 (5)	100 (15)	100 (5)	100 (20)	99/146/155	84/91/105	100/100/100	100/100/100	High/ Medium/ High
P16*	100 (8)	100 (5)	100 (5)	100 (10)	100 (17)	100 (18)	40/74/81	50/138/182	100/100/100	100/100/100	Medium/ Medium/ Medium
P17*	100 (5)	100 (5)	100 (5)	100 (9)	100 (13)	100 (19)	102/142/150	48/75/185	100/100/100	100/100/100	High/ Medium/ High
P27*	100 (7)	100 (10)	100 (7)	100 (10)	100 (8)	100 (15)	58/122/113	35/144/146	100/100/100	100/100/100	Medium/ Medium/ High
PARTICIPANTS WHO SHOWED LOW ACCURACY WHICH DECREASED FURTHER											
P1°	100 (5)	83.33 (6)	100 (5)	70 (10)	43.75 (16)	40 (15)	20/18/14	50/79/79	100/87.5/100	87.7/75/91	Low/Low/Low
P4°	100 (8)	87.50 (8)	100 (5)	81.81 (10)	73.33 (15)	66.67 (21)	77/49/39	72/83/124	100/100/100	87.5/87.5/100	Low/Low/Low
P22°	100 (6)	83.33 (6)	100 (5)	75 (16)	66.66 (15)	63 (20)	84/52/85	38/93/138	100/87.5/100	87/75/87.5	Low/Low/Low
P9†	100 (5)	100 (5)	100 (5)	90.90 (11)	52.94 (17)	47.05 (17)	130/54/54	36/155/198	100/100/100	100/75/87.5	Medium/ Low/Low
P24†	100 (7)	100 (7)	100 (6)	100 (12)	87.50 (16)	68.42 (19)	61/100/124	58/53/181	100/100/100	100/100/100	Low/Low/Low
P29†	100 (8)	100 (8)	100 (5)	100 (8)	66.66 (9)	58.33 (24)	41/92/51	43/56/157	100/100/100	100/100/100	Low/Low/Low
PARTICIPANTS WHO SHOWED LOW ACCURACY AND REMAINED AT THAT LEVEL OR SLIGHTLY IMPROVED											
P2°	100 (5)	85.71 (7)	100 (5)	66.66 (9)	64.28 (14)	78.94 (19)	41/66/89	47/67/227	100/62.5/100	87.5/75/95.83	Medium/ Low/High
P3°	100 (5)	100 (8)	100 (5)	81.81 (11)	62.50 (7)	72 (18)	135/185/120	184/253/240	100/87.5/100	87.5/87.5/100	Medium/ Low/High
P18†	100 (7)	100 (8)	100 (5)	92.30 (13)	82.35 (17)	100 (20)	95/46/71	117/136/152	100/100/100	100/87.5/100	Medium/ Medium/ Medium
P19†	100 (8)	100 (7)	100 (5)	100 (10)	92.30 (14)	100 (20)	122/52/165	52/129/208	100/100/100	100/100/100	Medium/ Medium/ Medium

The next group of participants involves Polish heritage children who already showed lower accuracy than other heritage children in the production task with locative case at either Time 1 or Time 2 and their accuracy decreased further at Time 3. Interestingly, their proficiency in Polish either decreases, remains stable or only slightly increases whereas their increase in

[9] **Green** * – stands for a group of Polish heritage children who achieved top accuracy, **Amber** †- stands for a group of Polish heritage children who achieved moderate accuracy and **Red** ° - stands for a group of Polish heritage children who achieved lowest accuracy. These are grouped based on their performance for locative only across Time 1 and Time 2.

proficiency in English is more prominent. Their social networks however remain consistently low at all times apart from one child who went from medium social network at Time 1 to low at Time 2 and Time 3. I present this decrease in accuracy in Figure 13 below.

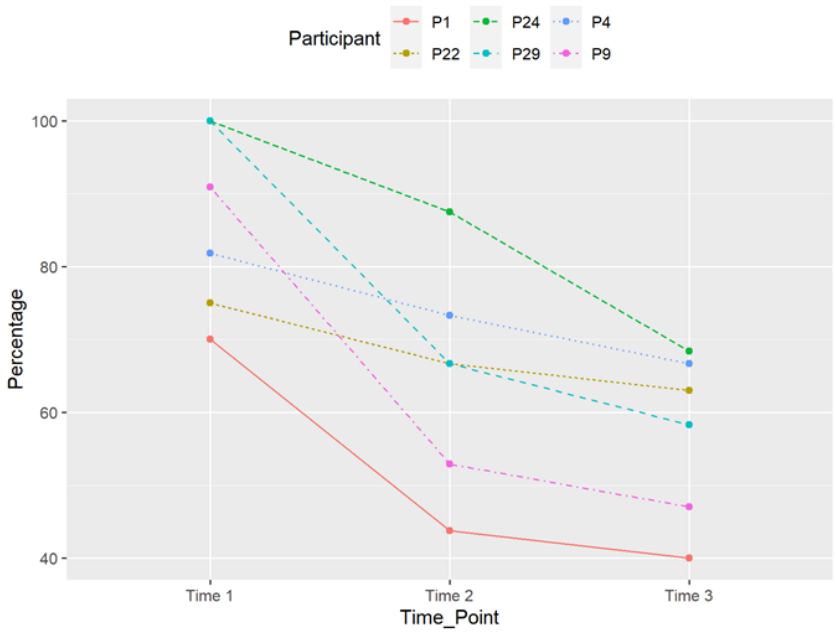


Figure 13 Results from Polish heritage children at Time 3 showing further decrease in accuracy who previously showed lower accuracy

The remaining group of participants are those Polish heritage children who either showed no decreased accuracy in the production task with locative case at Time 1 but then their accuracy decreased at Time 2 compared to other heritage children. However, as opposed to the previous group, their accuracy for locative production increased at Time 3 which is presented in Figure 14 below. These children's proficiency in Polish increases at Time 3, but not substantially. Nevertheless, this increase is more than in the previous group. However, their proficiency in English increases by twofold. As far as their social networks are concerned, they either remain medium across Time 1, 2 and 3 or change from low at Time 2 to high at Time 3.

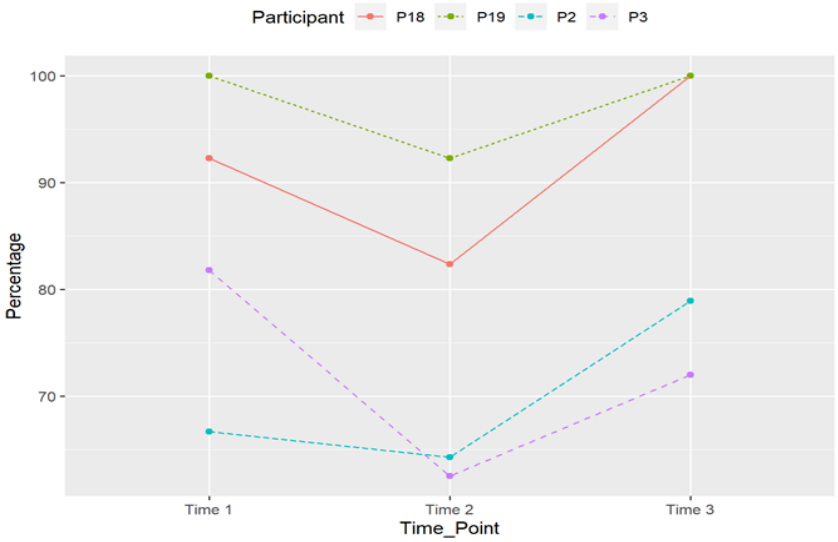


Figure 14 Results from Polish heritage children at Time 3 who previously showed no decreased accuracy at Time 1 but their accuracy decreased at Time 2

It is immediately observable that social networks, at least at this descriptive level, seem to play a role here in the accuracy of locative case. One of the participants made the following comment regarding his social network at school: '*Sometimes, we are secretly speaking Polish, but we are not allowed to during the lessons so we are being very quiet, but during school breaks we can of course speak Polish to each other*'. Another interesting aspect to these results is that all of these participants in all three groups enhance their performance as far as AJT is concerned and no decrease in accuracy in locative is observed. This is perhaps because there is a tendency among heritage speakers to have fairly well-developed receptive skills whereas their productive skills tend to vary considerably (Polinsky & Kagan, 2007). As far as genitive accuracy is concerned, it also increases for all of the children in the three groups in both production and AJT (or remains at 100% accuracy in case of the best performers).

To sum up, these results show that whilst at this stage (after two years of school) the Polish heritage children who were the highest performers remain proficient in their minority language, children who showed reduced accuracy (whether it was just slightly or quite substantially reduced) are still equally at risk of showing even more reduced accuracy later in time or equally have a chance of improving. Descriptively, this seems to be closely dependent upon social networks that they engage into throughout their school year.

In the next chapter, I discuss these results in the context of the research questions and the literature relating to this area.

Chapter 7 Discussion and conclusion

7.1 Introduction

The aim of this final chapter is to discuss the findings of the empirical study outlined in Chapter 6 with respect to the specific research questions investigated in this study and the overall context of heritage language acquisition. In the following Section 7.2, I review how the results from this study address the research questions and how they support or challenge the proposed accounts of heritage language acquisition and what they imply for HLA itself. In Section 7.3, I discuss the study's contributions which are followed by a discussion of its limitations in Section 7.4. I present a summary of this thesis in the final Section 7.5.

7.2 The findings in relation to the research questions

The principal aims of this thesis are to investigate how changes in input and exposure to the majority language affect heritage language acquisition in the first year of school, whether the heritage children's grammars are complete or not before they enter the mainstream education in the majority language and whether their grammars change as a result of fluctuations in their linguistic environment and social networks. The research questions addressed in this study were introduced in Chapter 5 and are repeated below:

RQ 1) To what extent is there evidence of incomplete acquisition of case among these heritage children in the first year of schooling?

a) Does this vary across the three grammatical cases investigated? (i.e. Nom, Gen poss, Loc)?

b) Is this consistent across tasks?

RQ 2) Does attrition occur during these heritage children's first year of schooling?

a) Does this vary across the three grammatical cases investigated? (i.e. Nom, Gen poss, Loc)?

b) Is this consistent across tasks?

RQ 3) To what extent is any increase or decrease in accuracy over the first year of schooling explained by language input and social networks?

The overall results of this study demonstrate that descriptively, at least on an individual basis (regarding a subgroup of children), changes in the input and increased exposure to the majority language do have an effect. Bearing in mind the overall goal of this thesis, as well as these overall results of this study, I am going to use the above research questions to discuss this in the rest of this chapter.

To reiterate, I investigated the three accounts that are used as explanations for the effects in heritage speakers: incomplete acquisition, parental input effects and attrition.

7.2.1 Incomplete acquisition

To begin with, I will discuss the incomplete acquisition account and whether or not the results of this study support or challenge it.

The first research question concerned the extent to which there is evidence of incomplete acquisition of grammatical case among heritage children in the first year of school (i.e. Reception in the UK educational system). It further explored whether this varied between the three grammatical cases investigated and if this was consistent across tasks. If incomplete acquisition of the bilingual group occurred, it would be manifested by lower accuracy than the monolingual baseline at Time 1. Recall that the hypotheses for the specific cases were as follows: locative, which is a lexical case, would be the most difficult case to acquire because it is acquired relatively late by monolingual children i.e. after the age of 2;5 in comparison to nominative (a structural case) and genitive (in its possessive function only), which are acquired before this age. Furthermore, locative being a lexical case requires a higher number of phonological alternations (Łuczyński, 2004) and involves a different knowledge than the structural case (i.e. nominative). I also expected the production task to be more challenging to the bilingual participants than the AJT because production is widely regarded as more challenging to heritage speakers (Montrul, 2016; Polinsky 2018); though regarding the AJT task speakers need to have grammatical intuitions; research has shown that it is difficult for HSs mainly because they do not feel confident with their judgements and may overaccept ungrammatical items (e.g. Rinke & Flores, (2014)).

In this study, the results varied between the three cases. With regards to nominative, which is a structural case Polish heritage children had no difficulties and this study suggests that this case is stable, which also agrees with previous studies (e.g. Laskowski, 2009; Koźmińska 2015; Wolski-Moskoff, 2019). The early acquisition of nominative case for monolingual children and its

abundance in the input are the factors that contributed to the said results. Similarly, genitive case (in its possessive function, which is acquired earliest amidst other genitive functions) is also not problematic with results from Time 1 showing 100% accuracy with this case. In contrast, the findings of this study show that some individuals (13 child heritage speakers, i.e. 43% in a group of 30) do appear to demonstrate some problems with respect of the locative case. At Time 1 this group of 13 speakers showed lower accuracy with this case than the monolingual Polish children, even though at group level, no significant difference from monolinguals was observed. The results also confirm that this is most visible in production. Below, I argue how to account for the above results and why these results challenge the incomplete acquisition account.

As already highlighted in the previous chapter, the fact that these results were not found at group level as compared to the monolinguals, does not diminish the results at the individual level and confirms their relevance for child heritage speakers (Luk & Rothman, 2022; Rothman *et al*., 2023). Note that the monolingual Polish children did not make any errors in this study because they were above the age when they would be assumed to have acquired them. However, bear in mind that locative case is said to appear as one of the last cases in its full form with a preposition in monolingual children (Łuczyński, 2004), and it is also a case that requires a higher number of phonological alternations which are more difficult to acquire (Łuczyński, 2004). This points to language-internal factors such as structural complexity associated with timing of acquisition. The distinction between lexical versus structural case has also been studied in the acquisition of German (e.g. Eisenbeiss *et al*., 2009) where it has been emphasized that "children's lexical case marking is developmentally delayed and more error prone than structural case marking because of the idiosyncratic properties of lexical Case assignment that have to be learned on an item-by-item basis" (Eisenbeiss *et al*., 2009: 27). The same results were found for Russian monolingual children (e.g. Babyonyshev, 1993). This shows that lexical case is the more complex case which involves different knowledge than the structural case. It is possible that some Polish heritage children need more time and more input for this structure to be fixed. This is observable in the individual results (i.e. in child heritage speakers who started attending nursery in the majority language very early on, although AoA for Polish heritage speakers as a group was not significant) and because their input conditions differ from those of monolingual L1 children, their results are also different.

It is worth mentioning that at this stage the heritage children have not just stopped using locative altogether (as for example heritage speakers in Polinsky's (2006) study did with the neuter gender) – they still use it, sometimes correctly, so this case is not missing from their repertoire. No child presented 0% accuracy rate of locative. This would show the lack of acquisition of this case (as pointed out by Flores, (2014)) – but even the child with the lowest

rate produced locative in 66% of instances. At this point, it is worth asking what kind of grammar allows them to produce it in 66% of contexts. This knowledge of case has to come from a grammar and where the child heritage speaker fails to produce it could be because they are not certain about the reflex or the expression of that functional category and the acquisition of locative is still ongoing.

In terms of the Polish input that the bilingual participants received from parents and friends, it is not surprising how such a large number of Polish heritage children (57%) still managed to present 100% case accuracy at the start of the school year. They show a similar pattern of acquisition as the monolingual children, showing 100% accuracy. Clearly, for these children the amount of input appears to have been sufficient enough to acquire the three cases. Equally, for the remaining 43% of children it may be that they have not received enough input to produce the locative in all contexts. This variability of acquisition and the effects of input are also in line with other recent studies of heritage children in the UK (e.g. Rodina *et al*., 2020) and of Polish children in Germany (e.g. Sopata, Rinke & Flores, 2024).

It is not just infrequent exposure to the heritage language, but also restricted contexts, e.g. poor or limited sources of exposure, no schooling, no public presence of the language and interaction beyond home (and their friends at school), etc. that affect HL development. This ties in with issues concerning the quality of the input that child heritage speakers are exposed to. This is important because the children who got 100% accuracy had high RoE and the ones who showed reduced accuracy had lower RoE. What is more, RoE played a significant role for Polish heritage children as a group. The current study provides significant evidence that input quality (RoE) is a predominant explanatory factor for case acquisition by Polish heritage children. These results show that input quality does play a role. Input quality includes factors such as who the interlocutors are and how meaningful the source of their input is. The meaningful input is the input that originates from friends that they chose for themselves and it seems important for their heritage language maintenance. The Polish heritage children who are 100% accurate get more meaningful input because they have Polish friends to interact with at school. I will discuss this and the issue of meaningful input which has been illustrated in Smith-Christmas' (2017) study in more detail in Section 7.2.3 when I discuss the role of social networks.

To summarise, the findings discussed above show that difficulties with one of the cases by Polish heritage children may be linked to the timing of acquisition of the structures (and their complexity) thus having language-internal reasons.

7.2.2 Parental input effects

Input quality may also refer to the input provided by the first generation, i.e. heritage parents, hence it is worth addressing the parental input effects in this study. To recapitulate, the parental input account suggests that we would see divergence in the language of the parents, as first-generation immigrants, arising due to prolonged contact with the L2 environment and migration. If parents do not show 100% accuracy it would be difficult to claim divergent acquisition in the case of their children – rather, it would be acquisition of a grammar which is being acquired based on attrited input. This is why it is also important to compare the heritage speakers' parents to monolingual controls. However, Polish heritage parents' knowledge of all grammatical cases in this study is no different from the knowledge of cases shown by monolingual adults in Poland. Both groups perform at ceiling in both tasks, though Polish heritage parents use all three cases with less frequency than the monolingual adults in Poland (see Table 27 in Appendix D). I did not expect any profound differences in the parents' grammatical representation of case. Despite the lack of drastic changes in the parental input (by which I mean the grammars of the parents that would provide input for the children), consistent with previous studies (e.g. Brehmer & Kurbangulova, 2017; Łyskawa & Nagy, 2019; Daskalaki *et al*., 2020; Coskun-Kunduz & Montrul, 2022), some lower scores were observed in the results for the heritage parents, which was used to assess their proficiency in Polish (mean proficiency score of 95.1, see Table 27 in Appendix D). This variation in proficiency results was also observed in the monolingual adults in Poland (albeit less so with a mean score of 97.9). This shows that Polish heritage parents perform similarly to the monolingual adults in Poland and show no significant lesser proficiency.

With regards to the frequency of cases in the input of heritage parents, (see Table 27 in Appendix D), I do not consider them to be substantially different from the frequency of all cases in monolingual adults for this to be a valid explanation of reduced input to their children. This is in contrast to Wolski-Moskoff's (2019) findings where first-generation parents used cases less frequently and this was concluded, amongst other factors, as having influence on the input they provide to their children. This difference is possibly due to the fact that Polish parents in the current study lived in the UK for 10 years of average as opposed to 23.5 years in Wolski-Moskoff's study. However, again most of the first-generation speakers were not the actual parents of the children in that study unlike in this study, which again emphasizes the importance of examining the input of the actual parents if research is being carried out on child heritage speakers.

To summarise, the findings discussed above show that the accuracy of the parents providing that input does not seem to be a predictive factor.

7.2.3 Grammatical changes as attrition

The second research question concerned the possibility of attrition and examined whether it occurs over the Polish heritage children's first year of Reception. It further explored whether this varied between cases and if this was consistent across tasks. If attrition occurs, this would be indicated by a decrease in accuracy from Time 1 to Time 2 (providing there was no evidence of incomplete acquisition at Time 1) as per my prediction. This prediction specified that if Polish heritage children in the UK perform the tasks with high accuracy at the beginning of the school year (start of the Reception – Time 1), but then at the end of the school year (Time 2) show changes in their task performance, then these changes could be a sign of the onset of attrition.

I argue that the findings in this study point to the onset of attrition (not in their grammatical knowledge but possibly in providing the exponent of this functional category such as locative case) taking place during the Polish heritage children's first year of Reception and that attrition effects do vary between cases (and affect only a subgroup of children). This is supported by the following evidence. In the analysis of the individual results, there is a decrease in accuracy from Time 1 (from 100%) to Time 2 (to less %) for 20% of the children which is statistically significant for the locative case and for heritage speakers as a group. The fact that the Polish heritage children enter school and are exposed to English and their input in HL reduces might cause their HL development to slow down, even though initially 20% of children develop like monolinguals. It could be an effect of being bilingual that affects their ability to provide the exponent of this functional category. Some of the Polish heritage children also used dimunitives which seemingly are used by monolingual Polish children as a strategy to avoid phonological alternations. It is difficult to conclude here that use of dimunitives by Polish heritage children is a case avoidance strategy, but it is possible due to the cognitive load. As already highlighted in the previous subsection, the fact that these results were not found at the group level as compared to the monolinguals, does not diminish the results at the individual level (Luk & Rothman, 2022; Rothman *et al*., 2023) and in general, it is very rare to find group level attrition (Baker, 2024; Schmid, 2011; Köpke, 2004). In this study, the evidence from Time 3, after the participants completed another year of schooling, shows that some of the children maintained a stable knowledge of this case while some improved it but in a reduced number of children (mainly those who have low Polish networks) some further decrease in accuracy was observed. For the other 43% of children in which locative development was not 'fixed' in the first place (i.e. who showed ongoing acquisition of this case), this might be even more prominent. For these children, locative case is still not in place when their input conditions change. It is possible that the changes in the quantity of L1 input and the increase of L2 input due to the start of schooling are contributing to the reduced accuracy observed in the data. Even though the specific age of onset (AoA) when the reduction of L1 input takes place (4-5 years old) was not statistically

significant for Polish heritage children as a group, individually it may also play an important role, as the extent of the observed changes may be more severe when the grammar is not fully fixed (Montrul & Polinsky, 2019). This highlights the importance of L1 maintenance for child heritage speakers especially when they start school.

To summarise, the findings discussed above are consistent with the attrition in providing the exponent of this functional category such as locative, but only by some Polish heritage children taking into account the effect of being bilingual. Since the results in this thesis suggest that these changes also correlate with the new social networks of the children in schools, I now discuss these in the next subsection.

7.2.4 Changes related to the social aspects of the first year at school and influence of social networks

The third research question concerns the social networks of the heritage children and their influence on case accuracy and examined to what extent any increase or decrease in accuracy over first year of Reception is explained by language input and social networks. Social networks are relevant for this study because when child heritage speakers start school in the majority language they get a significant change in the input and groups of children they socialise with, i.e. their peer group consists of other children. It is important because the children choose these friendships, not the parents. As a consequence, they also choose which language they speak with them. In general, social networks are relevant because they serve as a source of input for the majority language and are a driving force behind language change (Milroy, 1980). The increase or decrease in accuracy over the first year at school are likely to be influenced/modulated by input measures such as RoE (richness of exposure) and social networks variable interacting with time point. Polish heritage children with a higher RoE to Polish would show no or little decrease in accuracy over the first year of Reception and those with lower RoE would show decrease in accuracy. Furthermore, it would also suggest, in line with the predictions made earlier in this thesis, that those Polish heritage children who have more Polish friends at school would show more correct use of cases, whereas those Polish heritage children who have more English friends would show more incorrect case use and more reductions in case marking, which would support the hypothesis that social networks are an influential factor in heritage language development because they are a source of input either in Polish or in English. With regards to the composition of the Polish heritage children's social networks we would assume that their network of friendships would look different at the beginning and at the end of the school year as well as at the end of the following year and that this is likely to affect their accuracy results at the two times when they were tested but also at the third time, when some participants were tested as well.

Based on the results arising from this thesis, I argue that social networks have an influence on whether child heritage speakers show more correct or incorrect use of cases and that increase or decrease in accuracy over first year of Reception is explained by language input (i.e. RoE) and social networks, i.e. the lack of Polish spoken in Low/Medium Polish social networks is likely to offer fewer opportunities to use heritage language and this is likely to accelerate changes in the heritage native grammar. This is supported by the following evidence. In the analysis of the individual results, it is clear that lower accuracy scores were associated with the children who had non-existent Polish social networks at school, whereas the Polish heritage children who achieved the highest accuracy throughout the first year at school (100%) generally had stronger Polish friendship groups. What is more, the results from Time 3 (one year after the end of Reception) further support this claim. The results from the Time 1 and Time 2 attested this result descriptively: there is a tendency for the mean accuracy to be higher the stronger the Polish social network and higher social networks seem to correspond with higher accuracy. The impact of social networks seems to be further enhanced as far as heritage children's performance over time is concerned.

It was discussed earlier in this chapter that RoE plays a significant role for Polish heritage children as a group and this study supplies significant evidence that input quality is a predominant explanatory factor for the acquisition of case by Polish heritage children. It is worth restating that social networks are just one of the factors that contributes to RoE (others include engaging in extra-curricular activities, watching TV/media, using a computer/internet, reading/being read to) and one part of the overall RoE picture contributing to the attested outcomes. I considered this variable to be representative of input quality in this study and I argue that it plays a significant role in the heritage language development. This means that it is essential to pay attention to the quality of the input which heritage speaker children are exposed to as opposed to just the quantity of the input (e.g. Polinsky & Scontras, 2020, Serratrice & Sorrace, 2004). As I suggested in section 6.3.2, RoE and social networks were likely strongly correlated; however, some researchers have pointed out that while many measures listed above contribute to RoE, friends – or in other words, social networks – come to the forefront. For example, "amount of exposure can mean little if the child is exposed to language input for 2 hours a day by watching TV as opposed to the same amount of time interacting meaningfully with an interlocutor" (Montrul (2023: 405, cf. Carroll (2017). According to well-documented studies (e.g. Strouse & Samson, 2021) children learn less from video than they do from in-person instruction, a phenomenon known as "the video deficit." Hence I focus on the social networks in this study. As already highlighted in the previous chapters, since individual differences are very relevant for child heritage speakers (Luk & Rothman, 2022 and Rothman *et*

al., 2023), I think it is reasonable not to diminish the results at the individual level for this issue. I continue to explore social networks more generally below.

Recall that I equated the start of schooling for the Polish heritage children in the majority language (English) to a time when a great shift in the input takes place, but also an important adjustment/addition of social networks for these heritage speakers. At this point, it is crucial to consider what input is for these heritage speakers and how we decompose it. One of the components is who provides the input for the heritage speakers and who they socialise with. As such, I argue that this study brings a new dimension to understanding input for heritage language acquisition, particularly who provides it. Though it is undeniable that heritage speakers need sufficient exposure to input, I propose that this exposure also needs to be meaningful to these heritage speakers (i.e. making them feel like they belong into a given group). Smith-Christmas (2017) illustrated how Gaelic-English bilingual children in the Western Isles who had Gaelic spoken at home and at school chose to speak English with their friends because that was what was 'cool' and the other languages felt like authority languages i.e. not meaningful to what was important to them. Similarly, children in this study are making friends and choosing friends at school – it is about belonging and being one of the group. This allows them to experience a sense of belonging (Davis, 2012; Faircloth & Hamm, 2005; Hamm & Faircloth, 2005 in monolingual settings or Theobald (2017) in bilingual settings) where they do not feel alone or isolated. It is their choice of whether they are going to align themselves with a Polish group or an English group that can influence their linguistic development in the heritage language. In the literature, it has been emphasized that the second generation has a strong desire to fit in with the new society such as a school environment (Montrul, 2011) and "the need to adapt and be inconspicuous in the group (Laskowski, 2009: 65)". However, when presented with an environment where other bilingual heritage speaker children are present, these children can make a choice. This choice also seems to have far-reaching implications on the maintenance of their heritage language and their linguistic development. I argue that these choices are possibly partly based on the density of the social networks (i.e. number of available interlocutors) in a given school. This density is important as it contributes to the quality and quantity of input (Montrul & Polinsky, 2019) and previous studies (e.g. Kerswill, 1996) have confirmed that family on its own is not sufficient for the language to continue developing. This is also consistent with the findings in this study, which also seem to point to the importance of the variability of sources in heritage children's input for the language acquisition to be successful. I think it is reasonable to assume that this variability and density depends on the size of the community that the heritage children live in. Some Polish heritage children in this study entered the majority language schools with an overall presence of English language so these heritage children, in a way, had no choice as to what group (English or Polish) they would align

themselves to. On the other hand, some Polish heritage children in this study entered the majority language schools where not only English was present, but also where other Polish pupils were attending. This meant that they discovered that they could make choices whether they were going to align themselves with a Polish group or an English group of friends and develop their sense of belonging in their school. As far as whether this was a conscious choice, it is probable that, at first, this was less conscious based on how confident they felt with their majority language (English), i.e. the less proficient child heritage speakers would align themselves with the Polish group; then, as their confidence grew, this choice may have become more conscious. The size of the Polish heritage language community in this study seems to condition that choice. It was clear that in some schools more than in the others, the number of Polish pupils was noticeably higher, especially in the two Catholic schools where a vast number of participants for this study was located. This greater access to the Polish community meant that the Polish heritage children were sharing classrooms with many other children of Polish descent. The importance of a wider and heritage language input rich community setting has been emphasized in other studies (e.g. Laleko & Miroshnychenko, 2022: 188) where it was also confirmed that this "high degree of social entrenchment contributed to the preservation of morphosyntactic complexity in a heritage language" although it did not entirely prevent grammatical restructuring.

Although previous studies on Polish heritage speakers tried to identify the sociological factors such as social networks that influence the maintenance or loss of Polish (e.g.amongst Polish child heritage speakers in Sweden (Laskowski, 2009)), no suitable research methodology had been designed to carry out such research and this is the first study that looks into the social networks and their influence on the language of Polish heritage children at this age. Also, the community of Polish heritage children that Laskowski (2009) studied regarded quite a different reality of 1990s emigration of Polish people into Sweden. The post EU accession immigrant community I looked at is distinct in terms of its numbers, but also in terms if its permanence with no definitive plans to stay or to return (White, 2017), which seems to be an important characteristic if we consider that for such least permanent groups (in the UK) there is a tendency to develop dense Polish networks (Eade *et al*., 2007). With a much larger community comes a much larger infrastructure (churches, shops, clubs, and Saturday schools) and more possibilities to form dense social networks, especially when the actual ratio of Polish children in a given class is much higher than it used to be in the previous years. This sociolinguistic context contrasts with any school settings from previous years that would most likely contain a much smaller number of Polish pupils. This is a new community that has been presented with a choice to develop either Polish or English friendships; however, it is important to remember that this choice still depends on a composition of these communities and whilst some children will form

a close-knit friendship and sometimes will attend the same pre-schools before starting the majority language school, there will still be children who will not be presented with such an opportunity and they will be moving away from the heritage language and culture to the majority language and culture to match their English peers. This means that whilst, on one hand, the size of a minority language group will be making the heritage children more confident and willing to manifest their alliance with the heritage group (whether consciously or unconsciously), there will still be other children trying to 'fit in' to the majority language group to maximise their sense of belonging. This study confirms previous findings that fitting in in terms of linguistic abilities is also important to children as young as primary school aged children. Having Polish friends at an English language majority school provides not only a different context in which heritage speakers can talk and hear their heritage language, but also contributes to the variability of sources of learner's input which confirms previous findings (e.g. Embick *et al*., 2020) and the social network choices they make has implications for heritage language maintenance. What is more, any sort of alliance to either language can also be fluid in some Polish heritage children and for example, as they gain more confidence in English, they also switch their friendships for the ones in the majority language. I argue that this switching is consequential to their Polish language as per results from Time 3 that confirm that the children who continue their friendships with Polish children maintain high case accuracy in Polish. These findings are consistent with other studies where richness of HL was found to be a significant predictor of the bilingual children's accuracy, meaning that more diverse input included minority language friends (e.g. Correia, Lobo & Flores, 2024) or that being able to speak to a variety of interlocutors (e.g. Chondrogianni & Daskalaki, 2023), having broadened social networks during early immersion experiences on holidays (e.g. Kubota & Rothman, 2025) and experiencing a variety of language exposure (e.g. Torregrossa, Flores & Rinke, 2023) all affected the HL acquisition positively.

To put it briefly, the answer to the third research question in this study is that although, as a group, heritage Polish speakers do not produce statistically significant correlations as far as social networks are concerned, there is still an observable influence of these networks on an individual level. This confirms a better language performance for the children who keep Polish friends at least at the beginning of the school year than for those children who have more English friends. Starting school is consequential for child heritage speakers and supports the importance of social networks in the heritage language acquisition process. The social network structure of a community that is concentrated in large numbers and in a particular location such as Southampton promotes contact amongst its members. The above effects of social networks on heritage language maintenance and development provide a new angle to understanding the HLA and point to the friendship networks as an explanation for individual differences in heritage

speakers' acquisition of their minority language. Consequently, social networks can predict heritage language maintenance suggesting that they may be facilitative for HL maintenance.

In sum, the findings from this study show how both linguistic and sociocultural factors influence one another with great change in the input and adjustment/addition of social networks for the Polish heritage speaker children at the time they start school. This shows that Heritage Language Acquisition is complex and it can only be understood if we take into account various factors both linguistic and sociocultural (social networks and the sense of belonging). Regarding the latter, the influence of social networks is clearly noticeable at least at an individual level and it is a factor that conditioned the linguistic performance of child heritage speakers. These findings also highlight the importance of taking individual language history into consideration as suggested by Luk & Rothman (2022) and Rothman *et al*., (2023) and the need to account for individual differences when interpreting results obtained from heritage speakers.

7.2.5 Additional observations

Apart from the observations made in this study with regards to the research questions, I have also noted that the role of proficiency can influence the results regarding the acquisition of case for the children in this study. Recall that it has been maintained that control of the grammar in heritage speakers correlates with their lexical proficiency (e.g. Godson, 2003; Polinsky, 2006). This means that higher proficiency will result in fewer errors with case-marking and this also applies to Polish. I established that the more proficient speakers were more accurate in the case tasks. What is more, the results also showed that proficiency in the majority language for Polish heritage children doubled from Time 1 to Time 2 and also increased twofold from Time 2 to Time 3. This means that the lexical repertoire of the heritage children in English keeps increasing much faster than their lexicon in Polish (it stayed more or less equal from Time 1 to Time 2 and did not increase as dramatically from Time 2 to Time 3). What is more, it is easier for the more advanced speakers to access lexical items, which affects their comprehension and use of relevant structures (Benmamoun *et al*., 2013).

This finding constitutes a window into how quickly child heritage speakers make progress in the majority language after starting school for the Polish heritage children whilst their minority language remains stagnant in terms of the amount of vocabulary they acquire.

7.3 Contribution of the study

This longitudinal study contributes to Heritage Language Acquisition studies on heritage children and the influence of schooling in the majority language as it draws attention to the

potential vulnerability of this stage for some heritage children though arguably, not for all. It also contributes to studies on children of school age (and more specifically, on Polish heritage children in the UK) allowing for observations of heritage languages and their development or any potential changes over the years. In addition, it highlights the importance of input quality in terms of RoE to the minority language at this potentially vulnerable stage for heritage children. Perhaps those children who preserved 'monolingual like' accuracy were able to do so precisely because they have been exposed to a variety of sources from an early age and with particularly meaningful input from their heritage language social networks at school. It emphasises the fragility of some of the grammatical cases examined, e.g. locative, which is arguably the case which is acquired later during the course of monolingual acquisition. It also points to the importance of heritage language friendships which seem to play a role for everyone but only some children made gains. What is more, this study contributes to the growing number of studies on the role of social, as well as linguistic, factors in heritage language acquisition. It points to the importance of including these types of factors in such studies as they seem to affect the language development in children.

This thesis also highlights the importance of the quality of the input in terms of richness of sources to which the heritage speakers are exposed to. Social networks, particularly the ones that the children choose, are an important source of motivation for the heritage speakers and allow them to independently negotiate their identity. Having Polish friends at the majority school seems to make a difference, especially at such early stage as Reception because of the nature of this first year in school where they have less structured activities and substantially more opportunities to learn through play, meaning they get more opportunities to speak in their heritage language as opposed to speaking in/hearing the majority language when the activities are more structured. This study also emphasizes how, despite the complexity of HLA, we can better understand it if we take into account various factors, both linguistic and sociocultural.

Next, I discuss the limitations of the study.

7.4 Limitations of the study

In this section, I concentrate on the limitations of the present study focussing on those concerning the study sample and some methodological choices.

In order to produce more meaningful regression models and investigate more efficiently how the predictor variables contribute to the case accuracy, it would have been useful to have a larger number of participants, as this would have improved the model fit. However, finding bilingual heritage speakers for this type of studies (i.e. longitudinal) is a challenge especially since all of

the heritage speakers had to have started school at the time I was ready to start collecting data. The additional challenge was presented by the COVID pandemic which made it more difficult to carry out the study because this study involved face-to-face visits and required careful planning around the restrictions.

The goal of using the BiLEC questionnaire was, among others, to measure a number of variables relating to both input quality and quantity and this was carried out only at the beginning of the school year at Time 1. It would have been beneficial to use this measure at Time 2 and 3 as well in order to provide an even richer data set.

Finally, it would have been good to collect proficiency data from Polish monolingual children at all three time points and not exclusively at the beginning of the school year in order to confirm if their speech rate also increases at the end of the school year and a year afterwards. The same applies to the English monolingual children.

In the final section below, I provide a final summary and conclusion.

7.5 Summary and conclusion

The main theoretical proposals explain diverging from the baseline as incomplete acquisition (Montrul, 2008; Polinsky, 2006; Silva-Corvalán, 2003), attrition (Polinsky, 2011) and parental input effects (Pascual y Cabo, 2018; Montrul & Sanchez-Walker, 2013; Pires & Rothman, 2009). However, more recent approaches applied in the field of HLA examine sources of individual differences that account for individual variation in bilingual development that can be internal or external to a child heritage speaker (e.g. Rodina *et al*., 2020; Kupisch *et al*., 2021; Torregrossa, Flores & Rinke, 2023; Chondrogianni & Daskalaki, 2023; Sopata, Rinke & Flores, 2024; including studies on Polish child heritage speakers, e.g. Sopata, 2019; Rinke, Sopata & Flores, 2019; Sopata *et al*., 2021; Sopata & Długosz, 2021). These approaches to HL challenge the deficit-oriented perspectives highlighting the robustness of bilingual language acquisition, which is characterized by individual variation and input variability, and may not reflect interrupted development. In this thesis, I have investigated how changes in input and exposure to the majority and minority language affect heritage language acquisition in the first year of school. I have examined three main accounts which have been proposed as an explanation for differences in HL attainment. I have also tested the impact of heritage children's social networks on their heritage language maintenance. For this purpose, I developed a narrative retelling task and an acceptability judgement task to examine accuracy of three Polish cases: nominative, genitive and locative from Polish heritage children starting school in the majority language (English) in the UK.

The results of this study demonstrated that, when compared with the baseline, Polish heritage children show similar behaviour based on the data collected from the two tasks. However, a separate analysis of Polish heritage children as a group confirmed a statistically significant change in accuracy of one of the cases from Time 1 to Time 2, which meaningfully correlated with input quality (richness of exposure). Heritage speaker scores also demonstrated a high degree of heterogeneity. It is clear that, individually, some of the Polish heritage children diverge from the baseline (monolingual children in Poland), some show reduced accuracy later at the end of Reception, whilst others mirror the monolingual children's 100% accuracy across all three cases. In the light of the original hypotheses, in the first group of Polish heritage children problems with case are visible from the start, pointing to ongoing acquisition. These difficulties may be linked to the timing of acquisition of structures and their complexity thus having language-internal reasons. In some Polish heritage children, problems are visible at the end of the year, indicating the onset of attrition in providing the exponent of this functional category such as locative taking into account its structural complexity. What is more, the accuracy rate for some children who show ongoing acquisition decreases further as the year progresses, however, this only applies to the results of the locative being a lexical case, and not the other two cases. Although there is a significant change in accuracy over time, this is only applicable to the Polish heritage children as a group in both tasks and only to one of the cases, namely locative.

RoE plays a significant role for Polish heritage children as a group and this study supplies significant evidence that input quality is a predominant explanatory factor for the acquisition of case by Polish heritage children. In the analysis of the individual performance of the participants, low RoE to Polish was associated with lower accuracy scores, whereas the highest RoE scores were associated with the highest performing Polish heritage children. What we know about the Polish heritage children who achieved the highest accuracy throughout the first year at school (100%) is that they are characterised by a much higher average exposure to Polish per week and a much higher RoE to Polish, generally stronger Polish friendship groups and highest speech rate in Polish. Although, as a group, heritage Polish speakers do not produce statistically significant correlations as far as social networks are concerned, there is still an observable influence of these networks on an individual level that confirms generally a better language performance for the children who keep Polish friends at least at the beginning of the school year. Starting school signified changes in the input and an important adjustment/addition of social networks for the Polish heritage speaker children in the UK. This shows the importance of social networks in the heritage language acquisition process.

This data show that, descriptively, at least on an individual basis, changes in the input and increased exposure to the majority language do have an effect on the accuracy of case in Polish.

The results from Time 3 show that whilst at this stage (after two years of school) the Polish heritage children who were the highest performers remain proficient in their minority language, children who showed reduced accuracy (whether it was just slightly or quite substantially reduced) are still at risk of showing even more reduced accuracy later in time but equally a chance of improving. This seems to be closely dependent upon the density of the social networks in both languages that they engage in at school.

All things considered, this data points to ongoing acquisition for some children and indicates onset of attrition with no clearly visible role of parental input. The findings from this study show how both linguistic and sociocultural sides influence one another with great change in the input and adjustment/addition of social networks for the Polish heritage speaker children. This means that Heritage Language Acquisition is complex and it can only be understood if we take into account both linguistic and sociocultural factors together. This study enriches our understanding input for HLA, particularly who provides it and whether child heritage speakers simply want to speak the heritage language with their peers when presented with such opportunity. It also emphasizes that choice of language has far-reaching implications on the maintenance of their HL and their linguistic development and these choices are based on density of social networks and RoE. It also points to the importance of variability of sources in child heritage speakers' input for the heritage language acquisition to be effective.

To conclude, the results arising from this thesis allow us to better understand how changes in input and exposure to the majority language affect heritage language acquisition in the first year of school, and beyond. These results suggest that this is, probably, a more vulnerable time linguistically than expected leading to changes, but only for some areas of the grammar and for some children. Future research on child HLA should take into account the need to incorporate both linguistic and social factors and the need to look at individual differences.

Appendix A Proof of ethical approval

Anna Hart

From: ERGOII
Sent: 13 September 2021 13:00
To: Hart, A.
Subject: **Approved by Faculty Ethics Committee - ERGO II 66550**

Approved by Faculty Ethics Committee - ERGO II 66550

UNIVERSITY OF Southampton

ERGO II – Ethics and Research Governance Online https://www.ergo2.soton.ac.uk

Submission ID: 66550
Submission Title: The missing link: language and heritage, identity and belonging
Submitter Name: Anna Hart

Your submission has now been approved by the Faculty Ethics Committee. You can begin your research unless you are still awaiting any other reviews or conditions of your approval.

Comments:

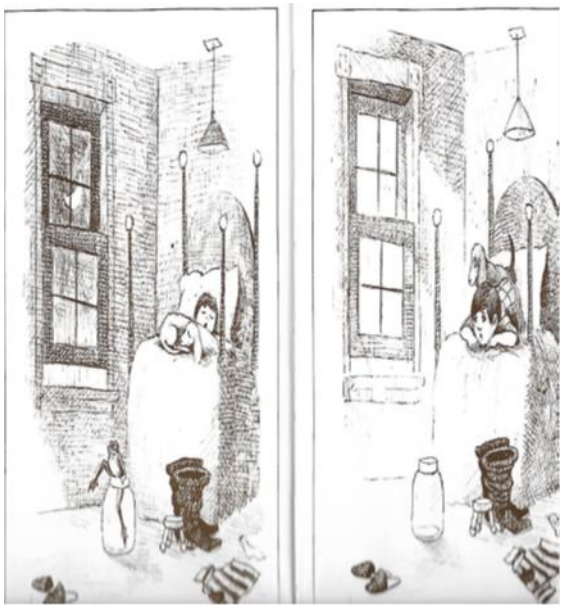
-
-

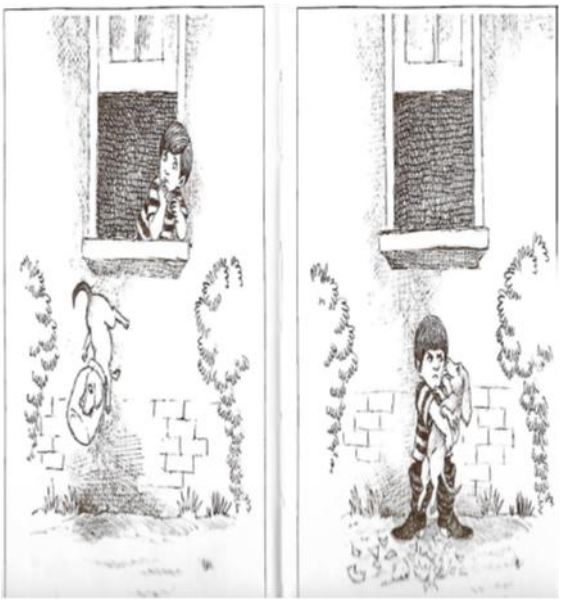
Click here to view the submission

TId: 23011_Email_to_submitter___Approval_from_Faculty_Ethics_committee__cat_B___C_ Id: 410324

ah1y19@soton.ac.uk coordinator

Appendix B The *Frog Story* narrative retelling task





Appendix C Bilingual Questionaire

BiLEC Questionnaire (English version)

Your child's Polish and English details

Today's date: __ __ / __ __ / __ __ __ __

What is your name? _____

What is your relation to the child? _____

What is their name? _____

What is their date of birth? __ __ / __ __ / __ __ __ __

Where were they born? _____

If outside the UK, when did they arrive here? __ __ / __ __ / __ __ __ __

Does your child have any brothers or sisters? _____

If so, please provide their names and ages here:

1. _____
2. _____ 3. _____ 4. _____

What is your current occupation? _____
What is your highest level of education? _____
What is the other parent's current occupation? _____
What is their highest level of education? _____
What year did you arrive in the UK?_____
What foreign languages did you learn at school and when?_____

Thank you for providing this general background information.

In the following sections, you will be asked to provide information about:

1. The amount of Polish and English your child hears and uses in day to day life
2. Who your child uses Polish and English with
3. Where your child uses Polish and English
4. The amount of Polish and English your child has previously heard

If your child did not start hearing both Polish and English from birth, please indicate which language came later, and at which age/date: _____

How well does your child speak Polish and English?

	Virtually cannot speak	Limited speaking ability	Some speaking ability	Good speaking ability	Excellent speaking ability	Native-like speaking ability
Polish						
English						

How well does your child understand Polish and English?

	Virtually cannot understand	Limited ability to understand	Some ability to understand	Good ability to understand	Excellent ability to understand	Native-like ability to understand
Polish						
English						

How many errors does your child make when speaking Polish and English?

This is not about what their accent sounds like, but instead errors such as using the wrong words or putting a sentence together incorrectly. (You can also note if others in the household make errors with either language too)

	Very many errors	Regular errors	Few errors	Virtually no errors
Polish				
English				

Does your child have regular contact with any other languages? _____

If so, please indicate which language(s), and give as much information as you can for the questions asked above about Polish and English:

_____

In the tables below, you will be asked to think about everybody who uses Polish and English with your child at home. If you need more space (for people or languages), please ask. Use the information in this table to help you understand what to put in each box:

Age started	*Enter the appropriate age. If birth, put 0. If specifying months, use y and m to distinguish - example 12 years 6 months = 12y 6m.*
Speaking level	*Use the initial letter of the scale provided for the child's own level on page 2 - V, L, S, G, E, N.*
Understanding level	
Amount used	*Give an estimated percentage of the amount this language is used with the child of all time spent speaking with them - example 60%.*

In this table, please indicate which of the following people speak Polish with your child regularly at home:

	Parents/guardians		Brothers/sisters				Other adults		
	You	Other	1	2	3	4	1	2	3
Age at which this person started using Polish									
Polish speaking level									
Polish understanding level									
Amount of Polish used with child									

In this table, please indicate which of the following people speak English with your child regularly at home:

	Parents/guardians		Brothers/sisters				Other adults		
	You	Other	1	2	3	4	1	2	3
Age at which this person started using English									
English speaking level									
English understanding level									
Amount of English used with child									

In the table below, you will be asked to think about everybody your child uses Polish and English with at home. If you need more space (for people or languages), please ask. Use the information in this table to help you understand what to put in each box:

Amount of language child uses	*Give an estimated percentage of the amount this language is used with the child of all time spent speaking with them - example 60%.*

In this table, please indicate which languages your child uses when speaking with the following people regularly at home:

	Parents/guardians		Brothers/sisters				Other adults		
	You	Other	1	2	3	4	1	2	3
Amount of Polish child uses									
Amount of English child uses									
Amount child uses other languages									

Does your child currently attend a school?_____
Does your child currently attend any after-school activities/care? _____

If yes to one or both, please complete the relevant part(s) of this table.

If no to both, please leave the table empty and start the next page.

	School				After-school care			
	Teacher(s)		Classmates		Adult(s)		Other children	
	English	Polish	English	Polish	English	Polish	English	Polish
Language speaking level								
Language understanding level								
Amount (%) language used								

How many weeks a year does your child have as holiday from these? _____

In this table, please indicate where your child typically spends their time on an average <u>week day (Monday - Friday)</u>, and which people they are with when at home.

WEEKDAY	AT HOME									AT SCHOOL	AT AFTER SCHOOL CARE
	Parents or guardians		Brothers and sisters				Other adults				
	You	Other	1	2	3	4	1	2	3		
05:00 - 05:30											
05:30 - 06:00											
06:00 - 06:30											
06:30 - 07:00											
07:00 - 07:30											
07:30 - 08:00											
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21:00 - 21:30											
21:30 - 22:00											
22:00 - 22:30											
22:30 - 23:00											

In this table, please indicate where your child typically spends their time on an average <u>weekend day (Saturday and Sunday)</u>, and which people they are with when at home.

WEEKEND	AT HOME									AT SCHOOL	AT AFTER SCHOOL CARE
	Parents or guardians		Brothers and sisters				Other adults				
	You	Other	1	2	3	4	1	2	3		
05:00 - 05:30											
05:30 - 06:00											
06:00 - 06:30											
06:30 - 07:00											
07:00 - 07:30											
07:30 - 08:00											
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22:00 - 22:30											
22:30 - 23:00											

(If you attend a religious service at the weekend, please provide this information in the 'other' column of the table on page 7).

In the following table, please provide information about your child's extra-curricular activities, including the amount of time spent on each activity and the percentage of each language your child uses in each situation:

	Sports and clubs	With friends	Watching TV/films	On Computer	Reading	Other
Hours per week spent on activity						
Amount of Polish child uses						
Amount of English child uses						
Amount child uses other languages						

Finally, in this table please provide an estimate of the amount of POLISH that your child regularly heard at home and outside the home in previous years:

	AT HOME									AT SCHOOL OR DAYCARE	AT OTHER ACTIVITIES
	Parents or guardians		Brothers and sisters				Other adults				
	You	Other	1	2	3	4	1	2	3		
0 - 1											
1 - 2											
2 - 3											
3 - 4											
4 - 5											
5 - 6											
6 - 7											
7 - 8											
8 - 9											
9 - 10											
10 - 11											
11 - 12											
12 - 13											
13 - 14											
14 - 15											

THANK YOU FOR PROVIDING ALL OF THIS INFORMATION

Appendix C

Kwestionariusz dla rodziców (Polish version)

Język polski i angielski Twojego dziecka

1. Data: __ __ / __ __ / __ __ __ __

2. Imię i nazwisko rodzica _____
3. Imię dziecka _____
   4. Data urodzenia dziecka __ __ / __ __ / __ __ __ __
   5. Miejsce urodzenia dziecka_____

6. Jeśli dziecko urodziło się poza Wielką Brytanią, proszę podać przybliżoną datę przyjazdu __ __ / __ __ __ __

7. Czy Twoje dziecko ma rodzeństwo? _____

Jeśli tak proszę podać ich imiona i wiek:

1. _____
2. _____
3. _____
4. _____

Jaki jest Twój obecnie wykonywany zawód?_____
Jakie wykształcenie posiadasz?_____
Zawód ojca_____
Jakie wykształcenie posiada ojciec?_____
Kiedy przyjechałeś/aś do Wielkiej Brytanii?_____
Jakich języków obcych uczyłeś/aś się w szkole oraz w jakich latach?_____

Dziękuję za udzielenie powyższych ogólnych informacji. W poniższej części kwestionariusza będę pytać o to:

5. Ile codziennie Twoje dziecko słyszy i używa języka polskiego i angielskiego?
6. Z kim Twoje dziecko używa języka polskiego a z kim angielskiego?
7. Gdzie Twoje dziecko używa języka polskiego a gdzie języka angielskiego?
8. Ile języka polskiego oraz ile języka angielskiego Twoje dziecko słyszało w swoim życiu?
9. Jeśli Twoje dziecko nie słyszało od urodzenia języka polskiego i angielskiego jednocześnie, proszę podać, który z tych języków zaczęło słyszeć później i od jakiego wieku: _____

12. Jak dobrze Twoje dziecko **mówi** po polsku i po angielsku?

	Praktycznie w ogóle nie mówi	Bardzo mało mówi	Potrafi trochę mówić	Mówi dobrze	Mówi doskonale	Mówi jak rodzimy użytkownik języka
J. polski						
J. angielski						

13. Jak dobrze Twoje dziecko **rozumie** język polski i angielski?

	Praktycznie w ogóle nie rozumie	Bardzo mało rozumie	Potrafi co nieco zrozumieć	Rozumie dobrze	Rozumie doskonale	Rozumie język jak rodzimy użytkownik
J. polski						
J. angielski						

14. Ile błędów językowych popełnia Twoje dziecko, kiedy **mówi** po polsku i po angielsku?

Nie chodzi tutaj o akcent, z jakim mówi dziecko, ale raczej o błędy językowe, jakie może popełniać, np.: używanie niepasujących słów lub też niegramatycznych zdań. (Można również zaznaczyć czy zdarza się w domu popełniać błędy innym osobom w którymkolwiek z języków)

	Popełnia bardzo dużo błędów	Regularnie popełnia błędy	Rzadko popełnia błędy	Praktycznie wcale nie popełnia błędów
J. polski				
J. angielski				

15. Czy Twoje dziecko ma regularny kontakt z innymi językami? _____
Jeśli tak, proszę zaznaczyć jaki to język(i) i udzielić jak najwięcej informacji jak powyżej w przypadku języka polskiego i języka angielskiego:

_____

16. W poniższej tabeli proszę, abyś zastanowił/a się nad tym kto w Twoim domu używa z dzieckiem języka polskiego i angielskiego. Poniżej znajdują się instrukcje jak należy udzielać odpowiedzi:

Wiek dziecka, w jakim zaczęto używać języka	*Należy wpisać wiek dziecka. Jeśli od urodzenia, należy wpisać 0. Można również podać wiek w latach i miesiącach, np. 2 lata i 6 miesięcy*
Poziom mówienia Poziom rozumienia	*Tutaj należy posłużyć się wcześniej wymienioną skalą:* Praktycznie w ogóle nie mówi/rozumie (1), Bardzo mało mówi/rozumie (2), Potrafi trochę mówić/co nieco zrozumieć (3), Mówi/rozumie dobrze (4), Mówi/rozumie doskonale (5), Mówi/rozumie język jak rodzimy użytkownik (6)
Ile procentowo używasz z dzieckiem danego języka	*Tutaj należy zaznaczyć ile procentowo używasz z dzieckiem danego języka, np.: 60%.*

W poniższej tabeli należy zaznaczyć, która z poniższych osób mówi regularnie do Twojego dziecka **w języku polskim** w domu:

	Rodzice		Brat/siostra				Pozostałe osoby dorosłe		
	Ty	Drugi rodzic	1	2	3	4	1	2	3
Ile lat miało dziecko, kiedy ta osoba zaczęła używać z nim języka polskiego									
Poziom języka polskiego - mówienie									
Poziom języka polskiego - zrozumienie									
Ile procentowo ta osoba mówi w języku polskim do Twojego dziecka									

W poniższej tabeli należy zaznaczyć, która z poniższych osób mówi regularnie do Twojego dziecka **w języku angielskim** w domu:

	Rodzice		Brat/siostra				Pozostałe osoby dorosłe		
	Ty	Drugi rodzic	1	2	3	4	1	2	3
Ile lat miało dziecko, kiedy ta osoba zaczęła używać z nim języka angielskiego									
Poziom języka angielskiego - mówienie									
Poziom języka angielskiego - zrozumienie									
Ile procentowo ta osoba mówi w języku angielskim do Twojego dziecka									

17. W poniższej tabeli proszę, abyś zastanowił/a się nad tym kto w Twoim domu używa z dzieckiem języka polskiego i angielskiego. Poniżej znajdują się instrukcje jak należy udzielać odpowiedzi:

Ile procentowo dana osoba używa z dzieckiem danego języka	*Tutaj należy zaznaczyć ile procentowo używasz z dzieckiem danego języka, np.: 60%.*

W poniższej tabeli należy zaznaczyć, którego języka Twoje dziecko używa regularnie rozmawiając z następującymi osobami w domu:

	Rodzice		Brat/siostra				Pozostałe osoby dorosłe		
	Ty	Drugi rodzic	1	2	3	4	1	2	3
Ile procentowo dziecko używa języka polskiego									
Ile procentowo dziecko używa języka angielskiego									
Ile procentowo dziecko używa pozostałych języków									

Czy Twoje dziecko uczęszcza obecnie na zajęcia pozaszkolne/korzysta z opiekunki do dziecka? _____

Jeśli tak, proszę uzupełnić odpowiednio poniższe rubryki.

	Zajęcia pozaszkolne				Opieka po szkole			
	Osoba prowadząca zajęcia		Rówieśnicy		Opiekunka do dzieci		Pozostałe dzieci	
	J. ang.	J. pol.	J. ang.	J. pol.	J. ang.	J. pol.	J. ang.	J. pol.
Poziom dot. mówienia								
Poziom dot. zrozumienia								
Ile procentowo dana osoba używa z dzieckiem danego języka								

Ile tygodni wakacji ma dziecko od udziału w powyższych zajęciach/korzystania z opieki? _____

18. W poniższej tabeli proszę zaznaczyć, gdzie Twoje dziecko spędza zazwyczaj czas w tygodniu (od poniedziałku do piątku) i z jakimi osobami przebywa, kiedy jest w domu.

PON-PIA	W DOMU									W SZKOLE	U OPIEKUN-KI PO SZKOLE
	Rodzic		Bracia i siostry				Pozostałe osoby dorosłe				
	Ty	Drugi rodzic	1	2	3	4	1	2	3		
05:00 - 05:30											
05:30 - 06:00											
06:00 - 06:30											
06:30 - 07:00											
07:00 - 07:30											
07:30 - 08:00											
08:00 - 08:30											
08:30 - 09:00											
09:00 - 09:30											
09:30 - 10:00											
10:00 - 10:30											
10:30 - 11:00											
11:00 - 11:30											
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18:00 - 18:30											
18:30 - 19:00											
19:00 - 19:30											
19:30 - 20:00											
20:00 - 20:30											
20:30 - 21:00											
21:00 - 21:30											
21:30 - 22:00											

19. W poniższej tabeli proszę zaznaczyć, gdzie Twoje dziecko spędza zazwyczaj czas w tygodniu (sobota i niedziela) i z jakimi osobami przebywa, kiedy jest w domu.

WEEKEND	W DOMU									W SZKOLE	U OPIEKUN-KI PO SZKOLE
	Rodzic		Bracia i siostry				Pozostałe osoby dorosłe				
	Ty	Drugi rodzic	1	2	3	4	1	2	3		
05:00 - 05:30											
05:30 - 06:00											
06:00 - 06:30											
06:30 - 07:00											
07:00 - 07:30											
07:30 - 08:00											
08:00 - 08:30											
08:30 - 09:00											
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18:30 - 19:00											
19:00 - 19:30											
19:30 - 20:00											
20:00 - 20:30											
20:30 - 21:00											
21:00 - 21:30											
21:30 - 22:00											

(Jeśli dziecko uczęszcza na mszę w weekend, proszę zaznaczyć w kolumnie 'pozostałe' poniżej w tabeli na następnej stronie

20. W poniższej tabeli proszę dostarczyć informacji o zajęciach pozaszkolnych dziecka, w tym ile czasu spędza wykonując te czynności i ile procentowo używa wtedy danego języka.

	Zajęcia sportowe i klubowe	Spotkania z przyjaciółmi	Oglądanie telewizji/filmów	Komputer/tablet	Czytanie	Pozostałe
Ile godzin tygodniowo poświęca na tę czynność						
Ile procentowo używa języka polskiego						
Ile procentowo używa języka angielskiego						
Ile procentowo używa innego języka						

21. Na koniec w poniższej tabeli proszę o wpisanie w przybliżeniu ile języka POLSKIEGO Twoje dziecko regularnie słyszało w domu i poza domem w poprzednich latach:

	W DOMU									W PRZEDSZKOLU/ŻŁOBKU	POZOSTAŁE ZAJĘCIA
	Rodzice		Brat/siostra				Pozostałe osoby dorosłe				
	Ty	Drugi rodzic	1	2	3	4	1	2	3		
0 - 1											
1 - 2											
2 - 3											
3 - 4											
4 - 5											
5 - 6											
6 - 7											
7 - 8											
8 - 9											
9 - 10											
10 - 11											
11 - 12											
12 - 13											
13 - 14											
14 - 15											

DZIĘKUJĘ SERDECZNIE ZA WYPEŁNIENIE KWESTIONARIUSZA!

Appendix D Additional Tables

Table 20 An overview of age and proficiency information about the English monolingual children

Participant	Age at time of testing (years)	English speech rate MONOLINGUALS
P111	4;1	85
P112	4;6	144
P113	4;8	71
P114	4;4	54
P115	4;5	118
P116	4;5	70
P117	5	49
P118	4;8	133
P119	4;4	80
P120	4;6	77
P121	4;4	140
P122	4;7	55
P123	4	70
P124	4;2	100
P125	4	77
P126	4;6	118
P127	5	70
P128	4	54
P129	4;6	120
P130	4;4	80
MEAN	4.48	88.25
RANGE	4;0- 5;0	49-144
SD	0.30	30.25

Table 21 An overview of age and proficiency information about the Polish monolingual children

Participant	Age at time of testing (years)	Polish speech rate MONOLINGUALS
P61	4;4	113
P62	4;6	67
P63	4;8	81
P64	4;4	87
P65	4;5	120
P66	4;5	102
P67	4;5	73
P68	4	41
P69	4;4	52
P70	4;6	94
P71	4;6	67
P72	4;7	32
P73	4	37
P74	4;2	37
P75	4	44
P76	4;6	40
P77	5;3	93
P78	4	116
P79	4;6	71
P80	4;4	160
P81	5;3	85
P82	5;3	122
P83	5;2	51
P84	4;5	59
P85	5;1	53
P86	5;2	58
P87	5;3	53
P88	5;2	79
P89	5;1	140
P90	4;3	111
MEAN	4.65	77.9
RANGE	4;0- 5;3	32-160
SD	0.43	33.4

Table 22 An overview of proficiency information about heritage parents and monolingual adult speakers

	Test A1-C2 Heritage parents	**Test A1-C2 Monolingual adults**
Mean	95.1	97.9
Median	95.5	98
Mode	99	99
SD	3.59	1.41
Range	85-100	95-100

Table 23 Detailed proficiency test results from heritage parents

Participant ID	***Proficiency test result***
P31	91
P32	93
P33	96
P34	94
P35	99
P36	92
P37	85
P38	90
P39	96
P40	95
P41	96
P42	95
P43	99
P44	99
P45	97
P46	99
P47	97
P48	100
P49	99
P50	93
P51	95
P52	91
P53	89
P54	93
P55	98
P56	98
P57	98
P58	99
P59	97
P60	98

Table 24 Outline of individual and categorical information about the Polish heritage children

Participant ID	UK born	Siblings	Birth order	Polish speaking parents	Mother's education level
P1	yes	yes	younger	2	College
P2	yes	no	N/A	2	Master's
P3	yes	yes	oldest	2	Master's
P4	yes	yes	younger	2	Master's
P5	yes	yes	younger	2	Bachelor's
P6	yes	yes	younger	2	Master's
P7	yes	yes	younger	2	College
P8	yes	yes	oldest	2	Master's
P9	yes	no	N/A	2	College
P10	yes	yes	oldest	2	College
P11	yes	yes	younger	2	Master's
P12	yes	no	N/A	2	Master's
P13	yes	yes	oldest	2	Master's
P14	yes	no	N/A	2	Master's
P15	yes	yes	younger	2	College
P16	yes	yes	younger	2	Master's
P17	yes	no	N/A	2	Master's
P18	yes	no	N/A	2	Master's
P19	yes	no	N/A	2	Master's
P20	yes	yes	younger	2	College
P21	yes	no	N/A	2	Master's
P22	yes	yes	younger	2	Master's
P23	yes	yes	younger	2	College
P24	yes	no	N/A	2	College
P25	yes	yes	oldest	2	College
P26	yes	no	N/A	2	College
P27	yes	no	N/A	2	Bachelor's
P28	yes	yes	oldest	2	College
P29	yes	no	N/A	2	Master's
P30	yes	no	N/A	2	Master's

Table 25 BiLEC questionnaire results

Participant ID	Age of exposure to English (years)	Hours a week Polish	Hours a week English	Average Polish spoken (%)	Average English spoken (%)
P1	1.55	33.7	44.8	72	28
P2	0.93	46.4	42.7	77	23
P3	1.58	47.6	40.9	70	30
P4	2	49	39.5	88	22
P5	2.5	56	39.5	86	14
P6	0.84	42.7	42.8	57	43
P7	3.47	51.6	32.9	69	31
P8	1.4	49.7	36.8	92	8
P9	3	54	32.5	90	10
P10	3.44	58.5	32.5	100	0
P11	1	40.9	45.6	76	24
P12	2.5	47	42.5	97	3
P13	3	57.5	35.5	95	5
P14	1.5	48.5	42.5	100	0
P15	2.5	55.2	37.8	91	9
P16	2.09	53.9	39.6	88	12
P17	2.54	51.9	41.1	70	30
P18	2.18	50.4	34.6	96	4
P19	2	55.1	35.4	90	10
P20	2.59	49.4	34.6	90	10
P21	2.5	53.2	35.3	85	15
P22	2.5	42.1	41.9	82	18
P23	3	48.1	37.9	92	8
P24	2.42	54.8	38.2	88	12
P25	1	59.8	33.2	99	1
P26	2	40	32.5	95	5
P27	3	54.4	34.2	98	2
P28	2	54.4	36.1	98	2
P29	1	55.1	35.4	80	20
P30	3	54	34.5	93	7
MEAN	2.16	50.49	37.77	86	13
RANGE	0.84-3.47	33.7-59.8	32.5-45.6	57-100	0-43
SD	0.76	6.03	3.94	10	11

Table 26 BiLEC questionnaire results – ctd.

Participant ID	Richness of exposure to Polish (%)	Richness of exposure to English (%)	Cumulative LoE to Polish in years	Cumulative LoE to English in years	Average exposure to Polish per week (home/school/ extra/holidays etc.) (%)	Average exposure to English per week (home/school/ extra/holidays etc.) (%)
P1	40	60	2.46	1.54	48	52
P2	41	59	2.25	1.75	47	53
P3	37	63	3.21	0.79	45	55
P4	34	66	2.9	1.1	44	56
P5	96	4	3.5	0.5	71	29
P6	56	44	2.65	1.35	51	49
P7	31	69	2.52	1.48	42	58
P8	42	58	2.93	1.07	59	41
P9	52	48	3.52	0.48	59	41
P10	53	47	3.93	0.07	60	40
P11	53	47	2.44	1.56	54	46
P12	43	57	2.84	1.16	57	43
P13	100	0	3.85	0.15	74	26
P14	82	18	2.86	1.14	68	32
P15	70	30	3.48	0.52	65	35
P16	68	32	3.4	0.6	70	30
P17	86	14	3.52	0.48	66	34
P18	53	47	3.52	0.48	63	37
P19	57	43	3.63	0.37	64	36
P20	43	57	3.61	0.39	42	58
P21	54	46	2.58	1.42	61	39
P22	46	54	2.92	1.08	44	56
P23	53	47	3.62	0.38	60	40
P24	56	44	3.75	0.25	65	35
P25	70	30	3.1	0.9	69	31
P26	80	20	3.89	0.3	73	27
P27	79	21	3.87	0.18	71	29
P28	83	17	3.7	0.3	72	28
P29	50	50	2.25	1.75	63	37
P30	76	24	3.63	0.37	73	27
MEAN	59	40	3.21	0.79	60	40
RANGE	31-100	0 – 90	2.25-3.93	0.07- 1.95	42-74	26-53
SD	18	18	0.53	0.52	10	10

Table 27 Mean average number of cases produced by each group in the study

Participant	NOM	GEN (ALL FUNCTIONS)	LOC
Heritage Parents	37.7	18.05	9.73
Monolingual adults	38.9	19.2	10.95
Heritage Polish children	30.1	12.6	8.7
Monolingual children	34.33	14.73	14.46

Appendix E Placement test for Polish heritage parents

Test plasujący z języka polskiego dla obcokrajowców.

Rozwiąż test.
Dokonaj wyboru poprawnej odpowiedzi :
a, b lub c, a w pytaniach/zdaniach nr 65, 74, 75, 76, 77,78, 85, 86, 96, 1
utwórz poprawną formę, uzupełniając lukę.

1. Jak się Pan nazywa?
a) Pan nazywa się Kowalski.
b) Nazywa się Kowalski.
c) Nazywam się Kowalski.

2. To jest Anna.
a) Co to jest?
b) Kto to jest?
c) Kto ona jest?

3. Piotr i Andrzej ..... z Polski.
a) są
b) jest
c) jesteśmy

4. Mój ojciec jest ..... .
a) dobry dentysta
b) dobrym dentystą
c) dobrą dentystką

5. Do pracy jadę ..... .
a) z autobusem
b) autobusem
c) na autobusie

6. Nie umiem ..... na nartach.
a) jeżdżę
b) jeździć
c) jechać

7. Lubię ..... .
a) mojego komputera
b) mój komputer
c) moim komputerem

8. Proszę kawę bez ..... .
a) cukier
b) cukrem
c) cukru

9. Osiemnaście plus dwieście piętnaście to ..... .

a) trzydzieści trzy
b) dwieście trzydzieści trzy
c) dwieście trzynaście

10. Lekcja zaczyna się o ..... (19:20)
a) dziesiątej dwadzieścia.
b) dziewiątej dwadzieścia.
c) dziewiętnastej dwadzieścia.

11. Często jemy w barach mlecznych, ale oni ..... w restauracji.
a) jem
b) jemy
c) jedzą
12. Wczoraj (my) ..... dziesięć godzin.
a) pracowali
b) pracowaliśmy
c) pracowały

13. Jutro Ania i Piotr ..... egzamin.
a) będą zdawać
b) będziecie zdawać
c) będą zdawały

14. Teraz mieszkam w ..... .
a) Polsce
b) Polska
c) Polski

15. Nauczyciel poprosił was, ... weszły do klasy.
a) żebyśmy
b) żeby
c) żebyście

16. Mężczyźni, ... uprawiają sport, żyją dłużej.
a) który
b) które
c) którzy

17. W zeszłym roku często ..... za granicę.
a) pojechałem
b) wyjeżdżałem
c) wyjechałem

18. ..... ludzie mają dużo problemów.
a) Ci
b) Te
c) Jacy

19. On urodził się w ..... roku.
a) siedemdziesiątym trzecim
b) siedemdziesiątego trzeciego
c) siedemdziesiąty trzeci

20. Kraków jest .....miastem od Tarnowa.
a) dłuższym

b) dużym
c) większym

21. Ten samochód został zaprojektowany przez ..... .
a) niego
b) jego
c) go

22. Powiedz ....., co dziś robiłeś?
a) mnie
b) mi
c) mną

23. Gdybyśmy były bogate, ... na długie wakacje.
a) pojechaliby
b) pojechałybyśmy
c) pojechalibyśmy

24. Kraków leży nad ..... .
d) Wiśle
e) Wisłę
f) Wisłą

25. Dziś jest zimniej ..... wczoraj.
a) niż
b) od
c) przed

26. ..... miał czas, przeczytałbym tę książkę.
a) gdybyś
b) gdyby
c) gdybym

27. Nie chodzę często do teatru, ... nie mam pieniędzy.
a) dlatego, że
b) dlatego
c) że

28. Ania zapytała mnie, ...widziałam ten film.
a) żebym
b) że
c) czy

29. .....ludzie lubią poznawać inne kultury i miejsca.
a) otwarte
b) otwarty
c) otwarci

30. Wieczorem najpierw zjem kolację, ... potem obejrzę film.
a) i
b) a
c) albo

31. Nasze miasto odwiedzili dwaj znani ..... .

a) Włosi
b) Włochy
c) Włoszki

32. Mój dziadek ..... z babcią w 1947 r.
a) pobrał się
b) wyszedł za mąż
c) ożenił się

33. Czy już skończyłeś ..... referat?
a) gotować
b) przygotować
c) przygotowywać

34. Olga dobrze czuje się w Polsce. Jej przyjaciele są bardzo
..... .
a) życzliwymi
b) życzliwe
c) życzliwi

35. Marek i Agata mają ..... dzieci.
a) cztery
b) czworo
c) czterech

36. W nowym miejscu zamieszkania brakowało mi ..... .
a) przyjaciele
b) przyjaciółmi
c) przyjaciół

37. Wczoraj cały dzień bolał mnie ząb. Wieczorem pojechałam .....
dentysty.
a) u
b) do
c) z

38. Przesyłamy serdeczne pozdrowienia ..... morza.
a) z
b) od
c) znad

39. Sławku, bardzo cię proszę, żebyś ..... ze mną do
teatru.
a) poszliśmy
b) poszedł
c) poszedłbyś

40. W wiadomościach radiowych mówili o tym, co dzieje się na .....
.
a) świat
b) światem
c) świecie

41. Niech państwo ..... na resztę gości.

a) zaczekać
b) zaczekali
c) zaczekają

42. Marysiu, ... czapkę, bo jest zimno.
a) ubiera
b) ubierz
c) ubrała

43. Kiedy go poprosiłam, zaraz ..... mi herbatę.
a) zrobić
b) zrobiła
c) zrobił

44. Z ..... nie mogę tutaj porozmawiać, bo nikt nie mówi po angielsku.
a) nikim
b) nikomu
c) nikt

45. Poinformowano mnie, że od kilku ..... nikt tu nie mieszkał.
a) rok
b) latami
c) lat

46. Od ..... pożyczyłeś pieniądze?
a) komu
b) kto
c) kogo

47. Maria ..... Sławkowi na urodziny nowy zegarek.
a) kupowała
b) kupił
c) kupiła

48. Ela codziennie ..... zakupy w supermarkecie.
a) zrobi
b) robi
c) zrobiła

49. Na zebranie przyszli studenci i .....
a) nauczycielami
b) nauczycielach
c) nauczyciele

50. Wybieramy aparaty coraz ..... w obsłudze.
a) łatwiejsze
b) najłatwiejsze
c) łatwiejszymi

51. Ten komputer okazał się ..... ze wszystkich w tym sklepie.
a) dobry
b) lepszy
c) najlepszy

52. Ewelina tłumaczyła się nie brakiem czasu, ale brakiem ..... na wakacje.
a) pieniędzmi
b) pieniądz
c) pieniędzy

53. Marek mi ....., kiedy będę się przeprowadzać.
a) pomoże
b) pomóc
c) pomagać

54. Nie zachowuj się tak jakby wszystko było przeciwko ..... .
a) ci
b) tobie
c) ciebie

55. Czy to prawda, że oni tak dużo pracują i mają ręce pełne ..... .
a) pieniędzy
b) roboty
c) zajęcia

56. Ty wiesz, że ja nigdy nie kłamię, zawsze mówię ..... .
a) kłamstwo
b) nieprawdę
c) prawdę

57. Marek waży 10 kg za dużo. Ma 10 kg ..... .
a) nadwagi
b) wagi
c) przewagi

58. Monika zawróciła Piotrowi w ..... .
a) sercu
b) mózgu
c) głowie

59. Pan Kowalski nigdy nie lubił pracować. Może właśnie dlatego niczego się nie ..... .
a) przerobił
b) nadrobił
c) dorobił

60. Jeszcze nie skończyłeś czytać tej książki, a już chcesz o niej dyskutować . Będzie lepiej, jeśli ..... ją do końca.
a) odczytasz
b) poczytasz
c) doczytasz

61. To są ważne dokumenty. Dlatego proszę się pod nimi starannie ..... .
a) zapisać
b) podpisać
c) wpisać

62. To słowo jest bardzo trudne. Nie potrafię go niestety ..... .

a) zamówić
b) omówić
c) wymówić

63. Przepraszam, że się spóźniłem, ale niestety ..... .
a) zaspałem
b) przespałem
c) wyspałem

64. Musimy bardzo wcześnie wstać, ... zdążyć na pociąg.
a) w celu
b) żeby
c) jeśli

65. Kiedy pił herbatę, rozmawiał z przyjacielem.

..... herbatę, rozmawiał z przyjacielem.

66. ..... choroby Jurek nie poszedł do szkoły.
a) W związku
b) Przez
c) Z powodu

67. Od kilku dni Ewa i Janek gniewają się na siebie. Ona wypomina
....., że za dużo pracuje.
a) on
b) mu
c) jego

68. Janek zarzuca Ewie, że nie dba o ich ..... dzieci i o dom.
a) dwa
b) dwie
c) dwójkę

69. W końcu może zrozumieją, że ona nie może żyć bez ..... .
a) jego
b) on
c) niego

70. On nie może żyć bez ..... .
a) niej
b) jej
c) nią

71. Wczoraj w fabryce palił się magazyn. Niestety, mimo szybkiej interwencji
..... się cały.
a) zapalił
b) wypalił
c) spalił

72. Kowalski jest świetnym biznesmenem. On ma rzeczywiście ..... .
a) głowę na karku
b) pstro w głowie
c) ciężką rękę

73. Oni bardzo mało zarabiają. Pracują dosłownie za ..... .
a) fortunę
b) ciężkie pieniądze
c) pół darmo

74. Boję się, że on tu wróci.
Boje się jego ..... tutaj.

75. Nie wierzyła, że ci ludzie są uczciwi.
Wątpiła w ich ..... .

76. Jeśli będzie deszcz, schronimy się w jakiejś najbliższej kawiarni.
W
razie.....
.. .

77. Powiedział, że boli go głowa i wyszedł z biura.
Pod pozorem
..... .

78. Chociaż jesteście różnej płci, macie takie same prawa.
Bez względu na
..... .

79. Miała duże powodzenie u chłopców, ... nie była piękna.
a) ponieważ
b) tymczasem
c) chociaż

80. Jestem zobowiązany do tajemnicy, ... nie odpowiem na to pytanie.
a) więc
b) ale
c) bowiem

81. Myślę czasami o .....(2) rodzeństwa, którego nie znam.
82. Urzędnik wziął kilka dni urlopu i wreszcie sobie.....
a) wypoczął
b) wypoczywał
c) spoczął

83. Twoje wspomnienia ..... mi na myśl moje dzieciństwo.
a) przywiozły
b) przywozili
c) przywiodły

84. Z naszą dietą .....nawet 10 kilogramów!
a) zrzucisz
b) wyrzucisz
c) odrzucisz

85. Wygrał ten konkurs, ponieważ wiele wiedział. = Dzięki
.....

86. Mężczyzna musi być odważny. = Mężczyznę musi cechować
.....

87. ..... swój błąd, zamilkł.
a) Spostrzegłszy
b) Spostrzeżony
c) Spostrzegła

88. Kierowca był ..... alkoholu.
a) podczas
b) w trakcie
c) pod wpływem

89. Na pustyni często ..... optycznemu złudzeniu.
a) ulega się
b) polega się
c) poświęca się

90. Podczas jedzenia ..... łyżką, nożem i widelcem.
a) używamy
b) posługujemy się
c) stosujemy
91. Dzisiaj nie ma na zajęciach .....: Kasi, Eli i Piotra.
a) troje studentów
b) trojga studentów
c) trojgu studentom

92. Dziewczynki lubią nosić kolorowe (pod/kolano)
..... .
93. Marzyli o zwiedzaniu (za/morze) .....
krain.

94. Twój wyjazd nie może stanąć nam na ..... .
a) przeszkodę
b) przeszkodą
c) przeszkodzie

95. Podjęto próby, żeby zreformować rząd. = Podjęto próby
.....reformy rządu.
a) w celu
b) mimo
c) w razie

96. Nie dasz sobie rady za granicą, jeśli nie będziesz znał języka.
Bez .....

97. Otworzył usta, ...zastanawiając się, co powiedzieć.
a) jakby
b) więc
c) kiedy

98. Dzwoniłem cały ranek, ale nie mogłem .....
do urzędu.
a) zadzwonić

b) dodzwonić się
c) dzwonić

99. To jest jasne i oczywiste. = To się rozumie ..... .
a) samo przez się
b) samemu przez siebie
c) sam dla siebie
100. Był zaniedbany i godny litości w tym swoim..... płaszczu.
(podrzeć)

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