

Language assessment of native Irish speaking children:
towards developing diagnostic testing for speech and
language therapy practice.

Sarah-Ann Muckley

Supervisors: Dr. Stanislava Antonijević -Elliott
Discipline of Speech and Language Therapy
School of Health Sciences
College of Medicine, Nursing and Health Sciences
National University of Ireland, Galway.

An Dr. Conchúr Ó Giollagáin
Aonad na Pleanála Teanga
Acadamh na hOllscolaíochta Gaeilge,
Ollscoil na hÉireann, Gaillimh.

April 2015

Table of contents

Declaration.....	7
Dedication.....	8
Acknowledgements.....	9
List of figures.....	11
List of tables.....	13
Chapter 1 Introduction and background	17
1.1 Introduction: overview of aims and methods.....	17
1.1.1 Organisation of the thesis	18
1.1.2 The researcher’s standpoint.....	18
1.2 Background: clinical motivation.....	20
1.2.1 Speech and Language Therapy practices in Ireland.....	23
1.2.2 Research: what has been done and what remains to be done..	27
1.3 Background: sociolinguistic context.....	31
1.3.1 Language change.....	35
Chapter 2 Literature review: effects of demographic and input factors on language development.....	41
2.1 Introduction.....	41
2.2 Birth order and language development.....	41
2.2.1 Possible reasons for a first born advantage.....	43
2.2.2 Possible reasons for a later born advantage.....	44
2.2.3 Birth order effects in <i>An Ghaeltacht</i>	46
2.3 Gender and language development.....	47
2.3.1 Gender effects in a context of language change.....	49
2.4 Socioeconomic status (SES) and language development.....	51
2.4.1 Differences in input across SES groups.....	52
2.4.2 Difference in input: an explanatory theory.....	53
2.4.3 SES effects on language development in <i>An Ghaeltacht</i>	54
2.5 Quantity of input and language development.....	55

2.5.1 Effect of the relative difficulty of acquisition of languages on the quantity of input necessary.....	56
2.5.2 Effect of the relative sociolinguistic status of languages on the quantity of input necessary.....	57
2.6 Quality of input and language development.....	58
Chapter 3 A description of major linguistic features of the Irish language.....	66
3.1 Introduction.....	66
3.2 Syntax.....	66
3.3 Morphology.....	67
3.4 Communicative functions.....	68
3.4.1 Time.....	69
3.4.2 Possession.....	72
3.4.3 Location.....	74
3.4.4 Plural.....	75
3.4.5 Question.....	77
3.4.6 Negative.....	77
3.4.7 Relationship between two clauses/constructions	78
3.5 Gender marking: a grammatical element with very low communicative weight.....	80
Chapter 4 Methodology.....	82
4.1 Introduction.....	82
4.2 Methodological approach.....	83
4.3 Participants.....	83
4.3.1 Ethics.....	83
4.3.2 Recruitment of participants.....	84
4.3.3 Selection of child participants.....	84
4.3.4 Further description of the child participant group.....	88
4.3.5 Selection and description of parent participants in the sample.....	93
4.4 Data collection: general overview.....	95
4.4.1 Narratives: procedures, justification and limitations	95

4.4.2 Questionnaires: procedures, description, justification and limitations.....	100
4.5 Data analysis.....	104
4.5.1 Narratives: transcription, coding and preliminary analysis...	104
4.5.2 Questionnaires: preliminary analysis.....	114
4.5.3 Statistical analysis: language production, input and demographic factors.....	115
4.5.3.1 Introduction.....	115
4.5.3.2 Summary statistics.....	116
4.5.3.3 Correlation tests.....	116
4.5.3.4 Distribution and trend tests.....	118
4.5.3.5 Multiple regression analyses.....	121
4.5.3.6 Reporting language measures and independent variables: expected relationships.....	122
Chapter 5 Results.....	124
5.1 Introduction.....	124
5.2 Summary statistics.....	125
5.3 Productivity.....	135
5.3.1 Productivity: correlation tests.....	135
5.3.2 Productivity: distribution and trend tests.....	138
5.3.3 Productivity: multiple regression analyses.....	142
5.3.4 Productivity: summary.....	145
5.4 Multi-clause Syntax.....	147
5.4.1 Multi-clause Syntax: correlation tests.....	147
5.4.2 Multi-clause Syntax: distribution and trend tests.....	150
5.4.3 Multi-clause Syntax: multiple regression analyses.....	154
5.4.4 Multi-clause Syntax : summary.....	158
5.5 Verb Vocabulary.....	160
5.5.1 Vocabulary: correlation tests.....	160
5.5.2 Vocabulary: distribution and trend tests.....	163
5.5.3 Vocabulary: multiple regression analyses.....	168
5.5.4 Vocabulary: summary.....	171
5.6 Grammatical Accuracy.....	171

5.6.1 Investigating the possibility that parent inconsistency is due to poor measure design.....	180
5.6.2 Grammatical Accuracy: correlation tests.....	191
5.6.3 Grammatical Accuracy: distribution and trend tests.....	199
5.6.4 Grammatical Accuracy: multiple regression analyses.....	214
5.6.5 Grammatical Accuracy: summary.....	223
5.7 Conclusion.....	225
Chapter 6 Discussion.....	229
6.1 Introduction.....	229
6.2 Review of chapter content.....	229
6.3 Summary of the thesis.....	229
6.4 Discussion of main findings.....	230
6.4.1 Investigating why there is a lack of grammatical accuracy development with age.....	232
6.4.1.1 Consistency and inconsistency in parents' language.....	233
6.4.1.2 Minimal grammatical accuracy development Between 3 and 6 years of age even in those measures on which parents are consistent.....	234
6.4.1.3 Considering inconsistency and minimal development after 3 years as symptoms of incomplete language acquisition or language attrition.....	235
6.4.1.4 The complexity of the system of rules and exceptions: one framework through which to consider consistent and inconsistent measures.....	237
6.4.1.5 Communicative weight or value: a framework through which to consider consistent and inconsistent measures.....	241
6.4.1.6 Complexity, communicative weight and other studies of Irish language development.....	242
6.4.1.7 Summary.....	244
6.5 Summary of implications for language planning in <i>An Ghaeltacht</i>.....	245

6.6 Summary of implications for clinical practice.....	245
6.7 Areas for future research.....	248
References	250
Appendix 1 Information sheets and consent and expression of interest forms: Irish and English	271
Appendix 2 Questionnaires : Irish and English.....	317
Appendix 3 Purpose and procedure of each subtest of WPPSI-III ^{UK}	352
Appendix 4 Scripts and pictures for both stories.....	353
Appendix 5 Utterance segmentation and other transcription conventions used in this study.....	381
Appendix 6 Further details on language measures outlined in Tables 18,19,20.....	387
Appendix 7 Comparison of the current and since birth Irish language input of child participants.....	407
Appendix 8 Acquisition of grammatical accuracy.....	408
Appendix 9 Table 44. Verb Vocabulary Types included in the children’s narratives and how many children produced them at each age group: a selection.....	414

Declaration by Candidate

I hereby declare that this thesis is my own work and effort and that it has not been submitted anywhere for any award. Where other sources of information have been used, they have been acknowledged.

Dedication

In loving memory of my Dad, Bernard.

Acknowledgements

There are a great many people to whom I would like to pay tribute at this point. I will begin with my supervisor Dr. Stanislava Antonijević-Elliott for her support, encouragement, patience and friendship. Many, many thanks. хвала.

Ar an ábhar céanna ba mhaith liom mo chuid buíochais a chur in iúl do Chonchúr Ó Giollagáin (stiúrthóir), do Bhrian Ó Curnáin agus do mhuintir an Acadaimh as ucht na cabhrach a thug siad dom agus mé i mbun taighde.

To all the faculty and staff of the Speech and Language Therapy Department in the National University of Ireland, Galway and to my fellow PhD candidates, Sarah Berthaud and Ciarán Lenoach, for their company, assistance and support: Thank you, merci beaucoup and go raibh míle maith agat.

I offer my thanks and appreciation to the clinicians and researchers who have discussed their work on minority language development with me, both here in Ireland and abroad. Don Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta go raibh míle maith agaibh as ucht na cabhrach a thug sibh domsa agus do phobal na Gaeilge thar na blianta. Go maire sibh an céad!

I would also like to thank my colleagues in the H.S.E. for their support and encouragement while I completed my thesis.

This doctoral study would have not have been possible without the assistance and support of the Gaeltacht community of South Connemara. To the children and the parents of An Spidéal, Indreabhán, An Tulach, Ros a Mhíl, An Cheathrú Rua, Camus, Ros Muc and Ceantar na nOileán, míle buíochas!

To the principals, teachers and staff of the following educational institutions who opened their doors to me and facilitated my research. Go raibh míle, míle maith agaibh: Naíonra Chonnacht, An Spidéal; Scoil Éinne, An Spidéal; An tIonad Tacaíochta Teaghlaigh (An Cranna Taca), An Cnoc; Scoil Náisiúnta Sailearna, An Cnoc; Scoil Náisiúnta Cholmcille, An Tulach; Scoil Náisiúnta Cholmcille, Ros a Mhíl; Naíonra Ros a' Mhíl; Scoil Náisiúnta Mhic Dara, An Cheathrú Rua; Naíonra Mhic Dara, An Cheathrú Rua; Scoil

Náisiúnta Leitir Mucú, Camus; Scoil Náisiúnta Mhuire, Ros Muc; Scoil Náisiúnta Cholmcille, Leitir Móir; Scoil Náisiúnta Thír an Fhia; Scoil Rónáin, Oileán na Trá Báine.

To my parents-in-law, Laoise and Stiofán Ó Comhraí, go raibh míle maith agaibh as ucht na sárthacaíochta a thug sibh dom thar na blianta.

To my brother Albert, to Lynn Muckley and to Theresia Karl, many thanks for your support and encouragement over the years. I owe a debt of thanks in particular to my brother Cal without whose encouragement and advice this thesis might never have been finished.

Many thanks to my parents, Ann and Bernard Muckley for their love and support, in every sense of the word, throughout my life and particularly for the opportunities they gave me to pursue my interests both academically and otherwise.

Ar deireadh thiar thall tá mé fíor-bhuíoch do Chormac Ó Comhraí, m`fhear céile agus ár mic, Ben-Eoghan agus Mártan faoin ngrá, faoin tacaíocht agus faoin ardú meanma a thugann siad dom gach lá de mo shaol.

List of Figures

Figure 1	Map of Ireland showing <i>An Ghaeltacht</i> in varying shades of blue (Ó Giollagáin et.,2007)33
Figure 2	Diagram of language shift continuum in <i>An Ghaeltacht</i> (based on a description by Ó Curnáin, 2009)38
Figure 3	Diagram of overview of methods of data collection95
Figure 4	Diagram of overview of data collection and analysis103
Figure 5	Graph of an example of parents' inconsistent performance. Total prepositional case inflection of nouns following the article.....172
Figure 5a	Graph of children's performance on Total prepositional case inflection of nouns following the article173
Figure 6	Graph of an example of parents' inconsistent performance. Total genitive case inflection of nouns174
Figure 6a	Graph of children's performance on Total genitive case inflection of nouns175
Figure 7	Graph of an example of parents' consistent performance. Parents' proclitic d' marking of past tense: proportion correct use in obligatory contexts176
Figure 7a	Graph of children's proclitic d' marking of past tense: proportion correct use in obligatory contexts177
Figure 8	Graph of an example of parents' consistent performance. Special word order: proportion correct use in obligatory contexts.....178
Figure 8a	Graph of children's special word order: proportion correct use in obligatory contexts179
Figure 9	Graph of an example of parents' inconsistent performance on subtypes and variations of inconsistent main measures. Prepositional case inflection of native Irish nouns following the article.....181
Figure 9a	Graph of children's performance on Prepositional case inflection of native Irish nouns following the article.....182

Chapter 1 Introduction and background

Figure 10	Graph of an example of parents inconsistent performance on subtypes and variations of inconsistent main measures. <i>sa + eclipsis</i>183
Figure 10a	Graph of children's performance on <i>sa + eclipsis</i>184
Figure 11	Graph of an example of parents' inconsistent performance on subtypes and variations of inconsistent main measures. Prepositional case inflection of nouns following the article (Type B).....185
Figure 11a	Graph of children's performance on Prepositional case inflection of nouns following the article (Type B).....186
Figure 12	Graph of an example of parents' inconsistent performance on subtypes and variations of inconsistent main measures. Initial mutation marking genitive case.....187
Figure 12a	Graph of children's performance on initial mutation marking of genitive case.....188

List of tables

Table 1	Detail on studies of Irish language development.....	30
Table 2	Studies cited in Chapter 2: language, country and other cultural information.....	62
Table 3	Lenited and eclipsed forms of consonants.....	68
Table 4	Irregular verbs across tenses.....	69
Table 5	Possessive pronouns and initial sound mutations.....	72
Table 6	Contrastive form of prepositional pronoun with the root <i>le</i>	73
Table 7	Examples of genitive case inflection used to show possession.....	73
Table 8	Prepositions and corresponding prepositional case inflections.....	74
Table 9	Diversity of plural morphemic changes and additions.....	76
Table 10	Examples of more irregular plural morphemic changes.....	77
Table 11	Reasons for exclusion of twenty-three children from the final sample of children included in the study.....	88
Table 12	Summary statistics with regard to age in months for final sample of children included in the study.....	89
Table 13	Proportion of children included in each category of Birth Order, Gender, Maternal Education and Child’s Educational Setting.....	90
Table 14	Kruskal-Wallis statistics for Age groups, Birth Order, Gender and Maternal Education across groups of each other.....	91
Table 15	Parental language status at time of recording.....	92
Table 16	Self-reported everyday parental language use with their child at time of recording.....	93
Table 17	Number of parents included in each category of Age,	

Chapter 1 Introduction and background

	Gender and Education.....	94
Table 18	Language measures: labels and definitions.....	108
Table 19	Grammatical Accuracy measures for which parents are consistent: labels and definitions.....	112
Table 20	Grammatical Accuracy measures for which parents were inconsistent: labels and definitions.....	114
Table 21	The nature of dependent and independent variables.....	116
Table 22	Rationale for the possibility that language development may be indicated by a decline rather than rise in particular language measures.....	123
Table 23	Summary statistics of children's Proportion Irish Input Since Birth by age group.....	125
Table 24	Summary statistics of children's performance by language measure (Productivity, Multi-clause Syntax and Verb Vocabulary) per age group	126
Table 25	Summary statistics of children's performance by Grammatical Accuracy language measure per age group.....	129
Table 25a	Summary statistics of high Irish input children's performance by Grammatical Accuracy language measures per age group.....	132
Table 26	Bivariate correlations for Productivity Measures and five independent variables.....	137
Table 27	Kruskal Wallis and Jonckheere trend statistics for Productivity measures across Age groups.....	140
Table 27a	Kruskal Wallis and Jonckheere trend statistics for Productivity measures across Input, Birth Order, Gender and Maternal Education groups.....	141
Table 28	Multiple regression coefficients for the prediction of Productivity measures.....	144
Table 29	Bivariate correlations for Multi-Clause Syntax measures and five independent measures.....	149
Table 30	Kruskal Wallis and Jonckheere trend statistics for Multi- clause Syntax measures across Age groups.....	152

Chapter 1 Introduction and background

Table 30a	Kruskal Wallis and Jonckheere trend statistics for Multi-clause Syntax measures across Irish Input, Birth Order, Gender and Maternal Education groups.....	153
Table 31	Multiple regression coefficients for the prediction of Multi-clause Syntax measures.....	156
Table 32	Bivariate correlations for Verb Vocabulary measures and five independent measures.....	162
Table 33	Kruskal Wallis and Jonckheere trend statistics for Verb Vocabulary measures across Age groups.....	165
Table 33a	Kruskal Wallis and Jonckheere trend statistics for Verb Vocabulary measures across Input, Birth Order, Gender and Maternal Education groups.....	166
Table 34	Multiple regression coefficients for the prediction of Verb Vocabulary measures.....	170
Table 35	Bivariate correlations for Grammatical Accuracy measures and five independent measures.....	194
Table 35a	Relative importance of five determiner variables for Grammatical Accuracy based on bivariate correlations presented in Table 33.....	198
Table 36	Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Age groups.....	202
Table 36a	Relative importance of Age for Grammatical Accuracy based on Kruskal Wallis and Jonckheere trend statistics in Table 34.....	206
Table 37	Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Input, Birth Order, Gender and Maternal Education groups.....	207
Table 37a	Relative importance of four grouped determiner variables for Grammatical Accuracy based on Kruskal Wallis and Jonckheere trend statistics in Table 35.....	213
Table 38	Multiple regression coefficients for the prediction of Grammatical Accuracy measures.....	217
Table 38a	Relative importance of five predictor variables	

Chapter 1 Introduction and background

	for Grammatical Accuracy based on results of multiple regression analyses presented in Table 36.....	222
Table 39	Most useful measures of each language domain according to R square coefficients and corroborated by evidence across other tests.....	228
Table 40	Types of multi-clause syntax: labels, definitions and examples.....	392
Table 41	Explanations and examples for subcategories and variations of grammatical accuracy measures for which parents were inconsistent.....	396
Table 42	Proportion Irish input: since birth, current and the direction and quantity of change over time.....	407
Table 43	Grammatical accuracy acquisition by age group.....	408
Table 44	Verb Vocabulary Types included in the children's narratives and how many children produced them at each age group: a selection.....	414

Chapter 1 Introduction and background

1.1 Introduction: overview of aims and methods and description of the researcher's standpoint.

Knowledge of typical language development, where available, is used as a comparative tool for the education of referral agents as well as for the efficacious assessment and treatment of language difficulties in children. Differing challenging structures or “problem spaces” (Bates, 2004, p.248) across languages result in differing patterns of development across languages. This cross-linguistic variety means that, for clinical purposes, knowledge of typical language development needs to be language specific (American Speech-Language-Hearing Association, 1985; Bates, Devescovi & Wulfeck, 2001; Royal College of Speech and Language Therapists, 2005; Thordardottir, 2005; Irish Association of Speech and Language Therapists, 2006). Much is known about the rate, sequence and error types of English language development right into school age. How sophisticated should we expect the Irish language production of typically developing preschool and school age children to be? This important question has not yet been answered (Kallen & Smith, 1992; Ó Murchú, 2001; Brennan, 2004; O’Toole & Fletcher, 2007/8; O’Toole & Hickey, 2013).

The aim of this thesis is to investigate typical Irish language production in bilingual L1 Irish speaking children for clinical purposes. Specifically, multiple language measures, including many which have been found to develop with age and differentiate between typical and atypical language development in other languages, were used to investigate the effects that age, gender, socioeconomic status (SES), birth order and quantity and quality of input have on language development. For this investigation, quasi-spontaneous language sampling data as well as questionnaires were used. The corpus of quasi-spontaneous language data were collected by audio-

recording L1 Irish speaking children and parents narrating stories with the support and common context of a picture book. The parents' data were used in the analysis of the quality of input while the children's data were used in the analysis of language production. Parents completed questionnaires which were used to gather information on the children's early development and their language background including the quantity of their Irish language input relative to their English (and/or other) language input.

1.1.1 Organisation of the thesis

This chapter presents a background to the study including a discussion of its clinical motivation. It also highlights the gaps in research in the field of Irish language development and describes the sociolinguistic context providing motivation for a relatively deep investigation of input factors. A discussion of the effects of quantity and quality of input, age, gender, SES and birth order on language development based on a review of the literature is presented in Chapter 2. In Chapter 3, a linguistic description of the Irish language is provided. In Chapter 4, the methodological approach adopted in this study and the methods of recruitment and selection of participants and data collecting and analysis are described and justified. The characteristics of the child and parent participant groups are also described. Results are presented in Chapter 5. Finally, in Chapter 6 the contribution to knowledge is discussed, its clinical implications are drawn and areas for further research are identified.

1.1.2 The researcher's standpoint

Theoretical standpoint

In this thesis, I assume a constructivist understanding of language acquisition. Two major components feed into the process of language acquisition: the child's own continually growing understanding of the world around them (including cognitive knowledge and knowledge of social interaction) and their exposure to linguistic input (Gathercole, 2007). I

Chapter 1 Introduction and background

assume that a critical mass of input is needed in order for the child to be able to abstract patterns in the input and therefore the amount of exposure also affects timing of development (Ambridge & Lieven, 2011).

In bilingual language acquisition one of these major components, the child's exposure to linguistic input, is generally reduced in each language (though, of course, not overall). If exposure to a language drops below a certain level (which has yet to be identified), acquisition can be relatively delayed (Blom, 2010; Barriere, Blum, Gillig & Meisels, 2011). This is more frequent in bilingualism than in monolingualism, of course, as exposure to one language can dominate at the expense of the other. Over generations, this subtractive bilingualism can lead to change in the weaker language at the level of the community. Such language change can be considered language loss or attrition when the functionality of the language is reduced.

I agree with Hale's (1992) interpretation that language loss is part of a much larger and slower process of loss of cultural and intellectual diversity. I would contend that this is, broadly speaking, a negative phenomenon.

Clinical standpoint.

It is the role of the paediatric speech and language therapist to support the wellbeing of each child with whom they work by affecting positive change in communication in each context of their daily lives. For bilingual children, this includes supporting the development of both languages. For language impaired bilingual speakers of a minority language, the majority language may, over time, become a more viable *lingua franca*. However, failing to support a minority language frequently spoken by friends and family can be socially and culturally isolating. Therefore, in the interest of promoting children's wellbeing, sufficient Speech and Language Therapy (SLT) support is warranted for a minority language despite the availability of the majority language as a *lingua franca*.

Personal standpoint

Finally, in terms of my personal standpoint, I am, myself, an Irish speaker although it is not my first language. I was raised through English with a little French. Irish was taught as an academic subject at school. I was sent by my parents to an Irish language summer school on the Aran Islands, Galway as an adolescent and later studied the language at University. I am now living in *An Ghaeltacht* and have chosen to raise my own children through Irish, a decision I might not have made had I not married a native Irish speaker from the area. We spoke Irish to each other from the beginning of our relationship and now speak only Irish to our children. This involved a conscious decision on my part but not on my husband's. We make an effort to consolidate their Irish language development by exposing them to other Irish speakers and to Irish language media when possible because we are aware that the acquisition of a minority language is a vulnerable process. For me, the Irish language, as a minority language, provides a strong link to the local community and to its heritage. I believe that growing up as a minority language speaker may benefit our children with regard to understanding other cultures with which they come into contact, an increasingly important part of modern life. Speaking the language whenever possible is the key. 'Books and recordings can preserve languages but only people and communities can keep them alive' (Lord, 1996, p.68)

1.2 Background: clinical motivation

Researchers in the area of Irish language development (Kallen & Smith, 1992; Kallen, 1996, 2002/3; O Toole & Fletcher, 2007/8, O'Toole & Hickey, 2013) have highlighted the need for appropriate SLT services through the medium of Irish. The need for such services through the medium of minority languages is widely recognised, as reflected in professional guidelines for best practice (e.g. American Speech-Language-Hearing Association, 1985; Royal College of Speech and Language Therapists (RCSLT), 2005; Irish Association of Speech and Language Therapists, 2006). Moreover, the European Charter for Regional or Minority Languages (1992) defined the rights of minority language speakers, encouraging the safeguarding and promotion of minority languages and the

rights of their speakers to services in their own language. Finally, the Irish Official Languages Act 2003 (Department of Community, Rural and Gaeltacht Affairs, 2003) means that the Irish state is legally obliged to make all public services, including SLT services, available through the medium of Irish.

However, providing an effective service for L1 speakers of minority languages, such as Irish, poses additional challenges for Speech and Language Therapists (SLTs) (Duquette, 1991; Goldstein, 2006). SLTs use knowledge of typical language development as a comparative tool for the education of referral agents as well as for the efficacious assessment and treatment of language difficulties in children. In current practice, the knowledge available is mostly based on English speaking children. Relatively little is known about the pattern of development in languages other than English. This is especially true in the case of minority languages such as Irish. Adding to the challenge is that most L1 Irish language speaking children will begin to acquire the majority language, English, early in life (Hickey, 2001). They are often exposed to English through the television and other media and particularly through their English speaking peers in the community, in childcare and early education (Hickey, 2001; Kallen, 2001). Additionally, data and theory of language development is mostly based on monolingual children. There is a relative paucity of research on bilingual language development. Furthermore and, as a result, much early literature on bilingualism was biased by ‘particular prejudices against bilingualism’ (Bialystok, 1991, p.1). For example, it was theorised that the infant brain was only naturally ready to acquire one language (Volterra & Taeschner, 1978). The logical extrapolation of this theory was that the extra burden of bilingualism was so confusing for children that it made them more susceptible to language impairment (Goldstein, 2006; Genessee, 2009). It is now widely accepted among researchers and SLTs that acquiring two languages is as natural as acquiring only one and that bilingualism neither causes nor exacerbates language impairment (Crutchley, 1999; Goldstein, 2006; Paradis 2007; Genessee, 2009; Paradis, Genessee, & Crago 2011). Nevertheless, bilingualism still makes identifying a language

impairment in children more difficult. Typical bilingual language development, especially that which includes incomplete acquisition or language loss or attrition with an environmental source, can be mistaken for language impairment and equally it can mask such an impairment. Incomplete L1 acquisition occurs in childhood when some parts of the language do not have a chance to reach age appropriate levels of proficiency after intense exposure to L2 begins (Montrul, 2008). Additionally, there is often a language mismatch between speakers of minority languages and the often monolingual majority language speaking speech and language therapist (Stow & Dodd, 2003). These factors combined with good intentions have resulted in inappropriate practices in SLT for minority language communities (Stow & Dodd, 2003; Paradis et al., 2011; Roseberry-McKibbin, 2008). Such a lack of understanding of bilingual language development has been a primary reason behind professionals giving flawed advice to parents, to abandon the home language in favour of the majority language if it is thought their child may have a language impairment (RCSLT, 1998, 2005; Paradis, 2007). As well as being detrimental to L1 and even their L2 acquisition (Juarez, 1983; Cummins, 2000; Kohnert, Yim, Nett, Kan & Duran 2005; Cordero & Kohnert, 2006; Lenoach, Ó Giollagáin and Ó Curnáin, 2012) this practice can lead to children being culturally and linguistically isolated (Stow and Dodd, 2003).

The situation has improved somewhat in recent years. Our understanding of bilingual language development has deepened and SLTs in training now receive relevant education about bilingualism (Healy, Lyons, O'Malley and Antonijević, 2010). SLTs' attitudes towards the home language is also more positive (Healy et al., 2010; O'Toole and Hickey, 2013) and professional best practice guidelines state that SLTs should encourage parents to continue to speak their own language to their language impaired children (RCSLT, 1998, 2005).

Furthermore, the Irish government through the Health Service Executive has created Irish speaking SLT posts to provide services through Irish medium in Irish speaking communities. This is, of course, a positive and necessary

step, however, to be effective, services need to be informed of and based on typical Irish language development (Kallen, 1996; O'Toole, 2009). As a result of a lack of research on typical acquisition of L1 Irish there is a lack of appropriate resources followed by a failure to provide a best practice service.

1.2.1 SLT practices in Ireland.

Despite a greater understanding of bilingual language development and the presence of Irish speaking SLTs, best practice is not yet possible in clinical practice with Irish speaking children (O'Toole & Hickey, 2013). This is due to an absence of appropriate assessment tools and to the pressure to fit into society's monolingual mould (O'Toole & Hickey, 2013). There is a lack of support for appropriate bilingual SLT service. For example, the Department of Education requires the use of standardised assessment scores as eligibility criteria for accessing appropriate educational support for children (O'Toole & Hickey, 2013). Irish language standardised speech and language assessments are, to date, non-existent and so therapists are forced to make do with inappropriate methods of assessment (O'Toole & Hickey, 2013).

Currently, because of a lack of knowledge of the typical course of Irish language development, neither informal nor formal assessment of Irish language development, are sufficient to facilitate making a diagnosis (O'Toole & Hickey, 2013). Even dynamic assessment (i.e. an assess, teach and reassess cycle) necessitates some kind of yardstick of what is typical development in order to facilitate choosing appropriate target linguistic forms. As a result, service based on research on English language development is the most often seen as the most viable alternative and is a common practice. Out of necessity, English language assessments are sometimes translated to Irish (O'Toole & Hickey, 2013). This practice is fraught with risk of results being very misleading because linguistic structures vary crosslinguistically (Kayser, 1995; Kallen, 1996; Roseberry-McKibbin, 2008). A concept may be expressed in one language by a linguistically simple structure and in another by a linguistically

sophisticated structure. Therefore, any given question on an English language assessment, when translated to Irish, may be too challenging or, alternatively, not challenging enough to effectively assess the language of the L1 Irish speaking child (Pert & Letts, 2003). Moreover, language use varies crosslinguistically according to sociolinguistic background adding to the inappropriateness of translating assessments (Miller, 1984; Genessee, Paradis & Crago, 2011). Also inappropriate is the comparison of Irish speaking children to normative data based on English speaking children for assessment purposes (O'Toole & Hickey, 2013). This is true even when this data is only used in the context of informal assessment and not in combination with a translated formal assessment. Normative data based on Irish speaking children are necessary for assessment because the different linguistic structure of Irish and different sociolinguistic background of its speakers means we can expect a different pattern in Irish language development.

Furthermore, as mentioned, most Irish speaking children will, by necessity, begin to acquire English early in their lives (Hickey, 2001; Kallen 2001). In the case of bilingual children, assessment in both languages is recommended (RCSLT, 2005). The speech and language therapist must make a differential diagnosis between a language *difficulty* due to limited knowledge of a weaker language and a language *impairment* which, in general, influences both of the child's languages (Grech & Dodd, 2007). This is only possible if both languages are assessed. Assessment of both languages allows a complete picture of language performance (Nicoladis & Genessee, 1997; Goldstein, 2006). When a child is bilingual in Irish and English, providing a service through the medium of English alone can be erroneously seen by parents and even SLTs as the most practical choice given that more English language assessment and therapy resources are available (O'Toole & Hickey, 2013). Parents of bilingual children sometimes request assessment through English (O'Toole & Hickey 2013). This language choice may be at least partially a result of parents' lack of confidence that Irish language educational resources and services are sufficiently well designed to meet the needs of their children (Ní Chionnaith,

2012). The historical dominance of monolingual majority language speaking SLTs in the profession, even in Irish speaking communities, has probably not promoted minority language speakers' confidence in the service. Parents and therapists may feel further justified in this language choice because the widespread use of English in society renders its acquisition important for the child's future welfare.

Due to the absence of a viable alternative, the use of monolingual norm-referenced testing material with bilingual children - despite being recognised as being inaccurate - is a common practice in Ireland (O'Toole & Hickey, 2013) as well as in the United States of America (Caesar & Kohler 2007; Gutiérrez-Clellan, Restrepo and Simon-Cerejido, 2006; Roseberry-McKibbin, 2008).¹ This is of course tempered, as far as possible, with clinical judgement, however, lack of knowledge of typical Irish language development means that clinical judgement is not as useful as it could be. Normative data developed from English monolingual speakers should never be applied to the non-dominant English of bilingual children (Roseberry-McKibbin, 1994; Bedore & Pena, 2008). A child's non-dominant language is usually their L2. Nevertheless the L1 can, over time, become the non-dominant language in particular cases of incomplete acquisition and/or language attrition. Children's non-dominant language cannot be expected to develop at a similar rate to monolingual speakers development of the same language. Assessing a child's non-dominant language in comparison to monolingual speakers of that language is therefore inappropriate and misleading and may lead to overidentification of language impairment.

If assessment fails to engage with both the languages of a bilingual child there is also a risk of over or underidentification of language impairment (Cummins, 2000; Gutiérrez-Clellan et al., 2006; Kallen & Smith, 1992; Ó Murchú, 2001; O'Toole & Fletcher, 2007/8). Overidentification occurs when typically developing bilingual children are identified as having a

¹ There are now quite a few norm-referenced assessments for use with Spanish-English children.

language impairment because of immature skills in their non-dominant language alone (Bedore & Pena, 2008). This can put undue pressure on services and have a negative effect on the self-esteem of the individual child and the minority language community. Underidentification, on the other hand, occurs when a bilingual child with a language impairment is not identified as such because it is assumed that their difficulty is due to bilingualism and will rectify itself with further exposure to the majority language (Bedore & Pena, 2008).

Such inappropriate assessment can also lead to inappropriate treatment. For example, as treatment is guided by assessment and treatment resources are far more widely available in English, treatment may be done through the L2 alone by default. Appropriate assessment, therefore, not only identifies language impairment effectively but also enables successful therapy planning (Stow, 2003). The goal of SLT is to effect positive change in communication, whether this is necessary in one language or more than one. If the child is to communicate in social domains in which each language is used then there is a need to provide support for both languages (Kohnert & Derr, 2004; Kohnert et al., 2005).

Being bilingual neither causes nor exacerbates a language impairment (Crutchley, 1999). Therefore, there is no reason to think that intervention in two languages would be problematic for a bilingual child. In fact a study of vocabulary learning in monolingual and bilingual children by Thordardottir, Ellis Weismer and Smith (1997) found that bilingual intervention does not negatively affect improvement in an L2 majority language and may positively affect it. Additionally, it has been found that for language specific difficulties, intervention should be provided in both languages (Holm, Ozanne, & Dodd, 1997). Finally, there is some evidence that efficacy of intervention is highest when the dominant language rather than the non-dominant language is used because of greater transfer of skills learnt in dominant to non-dominant language than in the other direction (Gutiérrez-Clellan, 1999). In summary, best practice is that intervention is carried out through both languages of the bilingual child (Goldstein, 2006), but if only

one language is to be used it should be the child's dominant language rather than their non-dominant language.

1.2.2 Research: what has been done and what remains to be done.

In order to adequately support SLT services for L1 Irish speaking children, an understanding of typical language development in this group is needed. Studies of L1 Irish language development (Hickey 1990a, 1990b, 1991, 1992, 1993; Ó Baoill, 1992; Bennett-Kastor, 1999; Brennan, 2004; Cameron-Faulkner & Hickey, 2008; O'Toole & Fletcher, 2007/8; Goodluck, Guilfoyle & Harrington, 2001; 2006) have, to date, provided a relatively small knowledge base as yet insufficient to adequately support SLT services (O'Toole & Hickey, 2013). Details of these studies are presented in Table 1 below.

Based on the grammatical development of three children, Hickey (1990b) developed a preliminary Irish adaptation of the LARSP which reflected the differing problem spaces inherent in the grammar of the Irish language and their effect on Irish language acquisition up to the age of 3 years. For example, Hickey (1992) found that plural morphemes were acquired later by her Irish speaking participants than described in normative data for English language acquisition and attributed this to the greater diversity in plural morphemes in Irish than in English.

Other research on Irish language acquisition has also concentrated on the performance of pre-school age children (Bennett-Kastor, 1999; Brennan, 2004; Hayes, 2007; Hickey, 1990a, 1990b, 1992; 1993; Ó Baoill, 1992; Ó Murchú, 2001; O'Toole & Fletcher, 2007/8) and largely those below the age of 3 and a half. Acknowledging the lack of information regarding typical grammatical accuracy and syntactic complexity after this age, Hickey (1990b) recommended the investigation of language production in older children. Some of the above mentioned studies (Bennett-Kastor, 1999; Brennan 2004; Hayes, 2007; Ó Baoill 1992) give an indication of the language production of older children. Based on longitudinal data from two

children, Ó Baoill suggested a possible pattern of development of the morphophonemic initial mutations found in Irish. In his data, he found that lenition appeared at about 21 months and increased in all appropriate contexts until it was used more consistently at 26 months. He also suggested that eclipsis may develop along well defined lines but did not propose ages for this. Brennan's (2004) data for three children indicated a later emergence of both lenition and eclipsis with none at all present until after 25 months. In her further data on the older language production of a total of 7 children, she found that these initial mutations appear and increase after 26 months but overgeneralisations still remain in the data of 3 and a half year olds (the oldest age for which data were collected in her study). We have very little knowledge of morphophonemic initial mutations or grammatical accuracy in general after this age. In a study which had its primary focus in narrative structure, Hayes (2007) provided examples of some grammatical errors made by four year olds which included verb omission, verb tense, verbal noun, preposition, initial mutation and determiner errors.

Bennett-Kastor (1999) provided a glimpse of syntactic complexity in the language of preschool children, in her study of the predication and cohesion produced by thirteen children under five in a narrative task. She reported coordinate and adverbial clauses at three years of age and the appearance of a relative clause in the language of a four year old. However this study may reflect a more advanced level of language than is in the population generally as the eight longest and most complete and intelligible stories of fifteen were chosen for analysis. Goodluck et al. (2001; 2006) studied relatively large samples (thirteen and twenty-one children respectively). A transparently described protocol was used to elicit relative clauses from L1 Irish speaking bilingual children. Results suggested that L1 Irish speaking children in *An Ghaeltacht* in the southwest of Ireland had acquired both movement and binding mechanisms for relative clause constructions by age five and that they additionally had a non-movement mechanism for forming subject relatives, one that is not found in the local adult Irish.

Chapter 1 Introduction and background

A study which builds on the findings of all these studies in its investigation of language production in L1 Irish speaking preschool and early school age children is necessary for clinical practice. Attainment of the psychometric properties needed to provide true normative data is not possible as numbers of L1 Irish speaking children are too small (O'Toole, 2009). The goal, instead, is both to outline a pattern of typical development to which we can compare children suspected of having language impairment (Brennan, 2004) and to gain an understanding of how various relevant factors (such as age and input) affect the pace of language development in this community.

O'Toole (2009) undertook a most valuable systematic study of the Irish language development of a relatively large group of children (21) aged between 16 and 40 months. There is, as yet, no study, as large and systematic as this one which looks at the language development of older children from three years right up to early school age. Further, the effects of age, gender, socioeconomic status (SES) and birth order are usually considered when collecting majority language developmental data (Fenson, Dale, Reznick, Bates, Thal, & Pethick, 1994; Feldman, Dollaghan, Campbell, Kurs-Lasky, Janosky & Paradise, 2000), but as Irish is a minority language there are additional elements that need to be considered. Not only is Irish structurally different to English, but the sociolinguistic context in which it is spoken is very different to the usual monolingual majority language sociolinguistic context in which English language normative data are collected. Irish is a minority language spoken in a context in which bilingualism with the socially dominant language, English, is unavoidable (Kallen, 2001). Therefore, in order to collect meaningful and useful information on Irish language development we need to do so in a way which is sensitive to the unique sociolinguistic context in which it is spoken. The effects of bilingualism and minority language status must be taken into account (Kallen, 1996; O'Toole & Hickey, 2013). Increased engagement with the sociolinguistic context and resultant heterogeneity of L1 Irish speaking bilinguals (Goldstein, 2006) will enhance the knowledge base.

Chapter 1 Introduction and background

Table 1. Detail on studies of Irish language development.

Studies	Number of children	Age in years; months	Nature of data	Geographical Area	Linguistic features/domain
Hickey, 1987; 1990a; 1990b; 1991; 1992; 1993.	3	1;4- 3;0	Longitudinal	Kerry <i>Gaeltacht</i>	Syntax, Morphology, Lexicon.
Ó Baoill, 1992.	2	Up to 2;2	Longitudinal	Unspecified area of <i>An Galltacht</i>	Morphophonemic initial mutations.
Bennett-Kastor, 1999.	13	3-5	Cross-sectional	Galway <i>Gaeltacht</i>	Predication and cohesion.
Goodluck, Guilfoyle & Harrington, 2001; 2006.	13 ; 21	4;9 - 8;5	Cross-sectional	Kerry <i>Gaeltacht</i>	Relative clause constructions.
Brennan, 2004.	8	1;0 - 3;0	Longitudinal	Aran Islands, Galway <i>Gaeltacht</i>	Phonology.
Hayes, 2007.	7	4;4 - 4;9	Cross-sectional	Galway <i>Gaeltacht</i>	Syntax and Morphology.
O'Toole & Fletcher, 2007/8; O'Toole, 2009.	21	1;4 - 3;4	Longitudinal	Kerry <i>Gaeltacht</i>	Lexicon, Morphology.
Cameron-Faulkner & Hickey, 2008; 2011	1	1;9	Data collected at one point in time	West of Ireland <i>Gaeltacht</i>	Input: Child directed maternal language.

1.3 Background: sociolinguistic context

Irish is the oldest recorded indigenous language of Ireland. It was also the native and everyday language of most of the population for millenia. Today, Irish is a minority language spoken by a very small section of the population and in close contact with the majority language, English. The eighteenth century saw the beginning of the growth of the use of English in native Irish speaking homes (Hindley, 1990). For more and more Irish speakers, English was seen as the language of power, advancement and, ultimately, survival. Language shift spread westwards from the east and downwards from the gentry to the greater population (Hindley, 1990) creating bilingual speakers among whom Irish eventually became seen as redundant. By 1800, Irish was still spoken by most of the population, but monolingual Irish speakers in the eastern half of the country were rare (Hindley, 1990). As early as 1851 only just under 5% of the country's entire population were found to still be monolingual Irish speakers, 18% reported as bilingual Irish and English speakers and the remainder, almost all monolingual English speakers (Census of Population: Ireland, 1851 cited in Hindley, 1990). Language revival movements and, since the foundation of the Irish state in 1922, government support have tried in vain to reverse this decline. The 1901 census returned 14% Irish speakers () and this increased over the following century to 31% in 1981 (The Central Statistics Office, 1985) and 41% in 2011 (The Central Statistics Office, 2012). However, these increasing numbers are reflective of the increase in L2 Irish speakers rather than any significant reverse in the decline of L1 Irish speakers. The increase in L2 Irish speakers in the 20th Century Census figures was a result of the cultural and language revival movements started near the end of the previous century and, from the 1920s onwards, the education system.

Censuses, from 1996 onwards, not only enquired as to respondents' ability to speak Irish but also their use of the language outside the education system giving a more accurate picture of everyday language use. Of the 1.77 million persons (aged 3 and over) who indicated that they could speak Irish

in the 2011 census, only 77,185 (1.8% of the population over 3 years) said that they spoke Irish on a daily basis outside of the education system (Central Statistics Office, 2012). Numbers of daily Irish speakers are most concentrated in areas, mostly along the western seaboard, known collectively as *An Ghaeltacht*. Overall, 24% of the population of *An Ghaeltacht* were daily speakers outside the education system. In areas with the highest concentration of daily Irish speakers this figure rises to above 70%. In 2011 there were over 23,000 people living in *An Ghaeltacht* who spoke Irish on a daily basis outside of the education system. Over 10,000 daily Irish speakers were living in *An Ghaeltacht* in Galway alone in 2011. This represents the greatest proportion of Gaeltacht daily Irish speakers at 43.5% of all daily Irish speakers in all Gaeltacht areas in 2011 (Central Statistics Office, 2012).

An Ghaeltacht is the collective name given to geographical areas which were considered by the government to be substantially Irish speaking and other bordering areas which have fewer Irish speakers but were included with the aim of maintaining and extending the use of Irish as a native language which is used in everyday situations (*Ministers and Secretaries (Amendment) Act, 1956.*). The area of *An Ghaeltacht* are defined by *The Gaeltacht Areas Orders, 1956–1982*, (The Central Statistics Office, 2012), and comprise areas in the seven counties of Cork, Donegal, Galway, Kerry, Meath, Mayo and Waterford. These areas are shown in varying shades of blue in Figure 1. According to census figures, there were a total of 96,628 persons aged 3 or over in *An Ghaeltacht* in 2011, but, evidently, given the statistics of Irish language use nationally, not all of these spoke Irish daily outside of the education system.

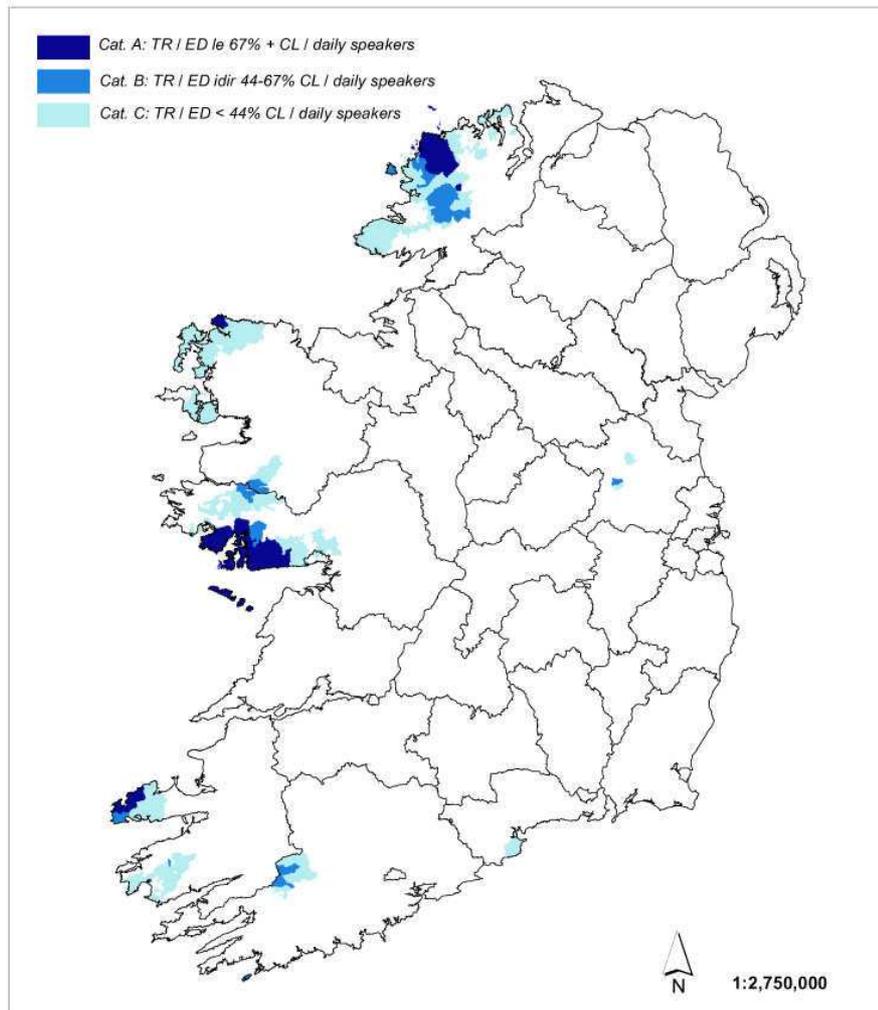


Figure 1. A map of Ireland showing *An Ghaeltacht* in varying shades of blue denoting proportion daily Irish language speakers. (Ó Giollagáin, Mac Donnacha, Ní Chualáin, Ní Sheaghda and O’Brien, 2007). See bilingual key on above image.

Modernisation in Ireland in approximately the last 50 years has led to a considerable change in language use patterns in *An Ghaeltacht*. As well as non-Irish speakers marrying into Irish speaking areas, entire non-Irish speaking families have come to live and work in *An Ghaeltacht*. Some native Irish speaking parents choose to raise their children through English (Lenoach, 2012). Also, people are travelling to socialise, shop, work and be educated in more English speaking areas and returning with altered patterns of language use. Extensive language mixing is now a very common practice.

An Ghaeltacht has, as a result of all these factors, become a less Irish speaking place. Ó Riagáin describes this as follows:

Social interaction systems have altered very considerably in the period since 1960, due to changes in demographic, occupational, educational, retailing and car ownership patterns. Until this point, social networks tended to be localized: since 1960 they have become increasingly more extensive and differentiated... the impact of these changes can be most clearly seen in the analysis of changes in home bilingualism... the number of marriages between fluent Irish speakers (is) in decline. (Ó Riagáin, 1997: 273-4).

Globalisation through the medium of English is also having a substantial impact on the use of Irish in *An Ghaeltacht* (Ó Giollagáin & Mac Donnacha, 2008; Lenoach, 2012). It is likely that, along with easier travel, the mass media and internet have helped to create weaker local social networks (Ó Curnáin, 2009). Despite the many benefits the mass media and internet afford to minority language communities, the presence of an alternative to local entertainment and social activity is likely to be a challenge to already weakened Irish language networks. A recent study of the use of Irish in *An Ghaeltacht* showed that in many areas of *An Ghaeltacht* the Irish speaking community is based on limited social networks alone often centred around an educational or cultural institution (Ó Giollagáin et al., 2007). In fact, Irish can only be considered the main community language in Category A districts of *An Ghaeltacht* (Ó Giollagáin et al., 2007). Category A Gaeltacht districts refer to electoral divisions where more than 67% of the total population (3 years+) are daily speakers of Irish (Ó Giollagáin et al., 2007).

These relatively strong Irish speaking districts are found in four counties: Donegal, Kerry, Mayo and Galway of which Galway has the largest. One result of modernisation and globalisation is that, today, there is 'near-universal bilingualism' (Stenson, 1993, p. 108) among Irish speakers. Even in Category A districts where, they are often in the majority, L1 Irish speakers generally become bilingual by necessity at a young age (Hickey,

2007; Kallen, 2001). The typical monolingualism of majority language speakers (and the majority language media) results in unavoidable bilingualism for young minority language speakers who inevitably come into contact with them. Ó Curnáin (2009) makes reference to how this happens in the everyday by use of a simple equation.

‘Beirt Ghall² + ochtar Gael³ = deichniúir Béarlóirí (This can be roughly translated as: two people of English culture + eight people of Gaelic culture equals ten English speakers.)

Indeed Ó Curnáin (2009) claims that it is unlikely that the current young people of *An Ghaeltacht* experience even one day in their lives that does not involve the English language. This claim is not at odds with the most recent research on language use in *An Ghaeltacht* (for example Ó Giollagáin et al., 2007; Cameron-Faulkner & Hickey, 2011; Lenoach et al., 2012; O’Toole & Hickey, 2013).

1.3.1 Language change

Internally motivated change takes place in all living languages (Thomason, 2001; Jones & Singh, 2005). Internally motivated change is any structural change which is independent of any sociolinguistic factors (Hickey, 2012). Such change can include, for example, sound changes for ease of articulation and changes in morphology resulting from native speaker creativity (Jones & Singh, 2005). These changes are usually simplifications or regularisations of the language. Externally motivated change, on the other hand, only takes place when languages are in contact with each other. Externally motivated change is change triggered and guided by social considerations including the influence of another language in use by the community (Hickey, 2012). It is relatively quick and includes such

² The English translation of *Gall* is often given as ‘foreigner’ or ‘Englishman’. Both more and less is meant by this word. In this context Ó Curnáin uses it to denote an English speaking person and also probably an outsider, someone who rejects or simply doesn’t engage in the Gaelic culture.

³ The word *Gael* can be translated to English as an Irish speaker of Gaelic heritage and culture.

phenomena as convergence of grammar and lexical borrowing. Rapid change can take place when there is an ‘asymmetrical dominance relationship’ (Jones & Singh, 2005, p.30) between the languages in contact. In this situation it is the minority language or the language which is perceived to have less social status which changes. This change is greater and quicker when the L1 minority language speakers are mostly bilingual, also being speakers of the majority language. As Irish is a minority language which is in close contact with a strong majority language and whose speakers are mostly bilingual we can expect that the rate of language change is quite rapid. Indeed, change in Irish is happening with such rapidity that it is widely asserted that the language may be dying (Hindley, 1990; Ó Curnáin, 2009; Ó Giollagáin et al., 2007). This is referred to as language obsolescence which is defined by Jones and Singh (2005) as:

a process occurring in a specific group of languages, currently undergoing a progressive decline in the number of their speakers, during which gradual reduction in use, due to domain restriction, may result in the emergence of historically inappropriate morphological and phonological forms together with extensive lexical borrowing.

Behind language obsolescence is the presence of subtractive bilingualism over generations and the resultant failure of intergenerational Irish language transmission i.e. the transmission of language from one generation to the next (Ó Curnáin, 2009). Subtractive bilingualism is when acquiring a second language results in significant negative influence on competence in the first. As English is used more and more in different social domains, Irish is, of course, used less. Ó Curnáin (2009) believes that the reduced frequency of Irish language in the input today’s young people received when acquiring language is a major reason why the language that is spoken by them is quite different from that spoken by previous generations. He refers to evidence that only the Irish language forms most frequent in adults’ talk are acquired by the young people (Lenoach, 2012). This incomplete acquisition can also be attributed to children’s reduced *usage* of the Irish

language due to having more experience of contexts of English language use than their parents. This begins a vicious circle of decline of language use and competence both in individuals (Montrul, 2008) and across generations (Ó Curnáin, 2009). This reduced competence in and use of the minority language is compensated by increased competence and use of structures of the majority language (Dressler, 1996; Lenoach et al., 2012) or use of the majority language itself. The Irish language becomes somewhat redundant in favour of the more widely used English language. This results in Irish language development being arrested in individuals. Lenoach (2012) reports lack of knowledge of Irish words for body parts such as bellybutton, eyelashes and toes in 16 year old native Irish speakers. Also reported by Ó Curnáin (2009) and Lenoach (2012) in L1 Irish speaking children and young people are use of English verb roots, lack of inflection marked by initial mutation and use of simplified syntax amongst other signs of probable arrested Irish language development. A relative reduction in competence in the Irish language, and the bilingual context which makes its use optional, results in Irish being used even less and this in turn leads to a further reduction in competence. This also has a detrimental effect across generations. This simpler version of Irish which is also spoken less often is then passed on to the next generation resulting in even less competence and, consequently, less use in the following generation.

The result of failure of intergenerational transmission of the language is the emergence of new kinds of Irish over generations. We can notice in a language shift continuum suggested by Ó Curnáin (2009) and illustrated in Figure 2, here, how the language of speakers born after 1960 seems to be gradually moving away from traditional Irish.

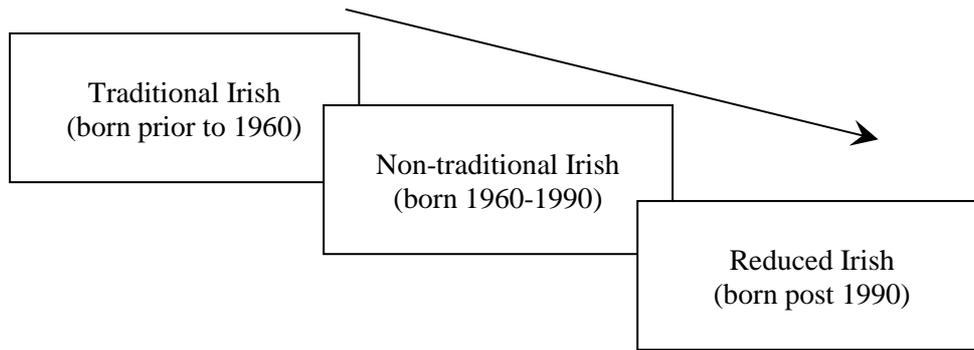


Figure 2. A diagram of language shift continuum in *An Ghaeltacht*. This diagram is based on a description by Ó Curnáin (2009).

The language spoken by L1 Irish speakers who were born prior to 1960 is termed Traditional Irish (Ó Curnáin, 2009). Speakers of traditional Irish had relatively little contact with English as they were acquiring their L1. Due to a lack of externally motivated change, their language differed little from the language spoken by previous generations of Irish speakers as far back as about 1700 (Ó Béarra, 2008). It is thought that by some (Ó Curnáin, 2009; Lenoach, 2012) that subtractive bilingualism in the generation that followed, i.e. those born between about 1960 and 1990, resulted in incomplete acquisition of traditional Irish. This new kind of Irish is described as Non-Traditional Irish and marks the beginning of major language change. Irish is simplifying and regularising in vocabulary, sound and grammar structures and seems to be moving gradually towards English language versions of these structures (Lenoach, 2012). L1 Irish speakers born after approximately 1990 are described as speaking a reduced version of post traditional Irish due to incomplete acquisition of Non-Traditional Irish and, to a lesser extent, Traditional Irish. This reduced version has the smallest variety of structures and the highest proportion of structures influenced by English. For example, in reduced Irish, the pronominal object of the verbal noun often follows the verbal noun rather than preceding it as happens in traditional Irish: *ag ól é*, rather than *(dh)á ól*. Unlike in traditional Irish, in reduced Irish, the object often appears in the same position relative to the verbal noun whether it is nominal or pronominal. This is also the case in English grammar (Ó Curnáin, 2012) Such simplification and reduction is common in minority languages

especially in the aspects of language which are furthest from the majority language such as, in the case of Irish, initial mutations (Ó Curnáin, 2009). In reduced Irish, initial mutations are often omitted, for example, *i grúpa* (in a group); *leis an pobal áitiúil* (with the local community) (Lenoach, 2012). Importantly, this reduced version is also less functional than the language spoken by previous generations (Dressler, 1996; Ó Giollagáin et al., 2007; Ó Giollagáin, 2012). For example, terms for even simple parts of the body are often only known to L1 Irish speaking children in English (Lenoach, 2012) and relative clause structures which differentiated between meanings in traditional Irish are used indiscriminately by today's young people (Goodluck et al., 2001; 2006). These new kinds of Irish should be thought of as part of a continuum of language decline across generations rather than as discrete stages. The reason for this is that language is affected by many factors at the level of the family and the individual (Ó Curnáin, 2007). Variation in language is affected by when and how exposure to the majority language starts and the quantity and quality of input of the minority one (Soracce & Serratrice; 2009). Therefore we can expect considerable variability even in the language of people of the same age (Ó Curnáin, 2007).

Ó Curnáin (2012) counted 357 post-traditional changes in Connemara Irish. The language has changed so much that the use of traditional Irish language forms can even be an obstacle to communication with the youngest generation (Ó Curnáin, 2012). These changes are across all domains of language: not only in morphology, phonology and vocabulary as mentioned by Jones and Singh (2005), but, also in syntax and pragmatics (Ó Curnáin, 2007; 2009; 2012; Lenoach, 2012). Such changes in minority languages can be a combination of movement towards the majority language (Wolfram, 2004; Lenoach, 2012) and retention of early acquired versions rather than progression to more adult-like versions of language use (Montrul, 2008). The relevance to the Irish language of the latter characteristic of change in minority languages will be considered when discussing results in this study. To date, information on which Irish language elements are earlier and which later acquired is not available.

As the Irish language is changing relatively rapidly and details of the language spoken by the generation who are providing the majority of input for today's children (i.e. their parents' generation) have not been sufficiently documented, it is also necessary to gather data on the quality of language used by the current generation of parents (Kallen, 1996 bilingualism and language disability). Additionally, as most Irish speaking children are bilingual and bilinguals (especially minority language speaking bilinguals) are not a homogeneous group (Nicoladis & Genesee, 1997; Gutiérrez-Clellan, 1999; Kallen, 1996; Domínguez, 2009) it is necessary to investigate the quantity of input received by each child in each language (Thordardottir & Brandeker, 2013). In summary, in this sociolinguistic context, the effects of quantity and quality of language input as well as the effects of gender, SES and birth order on language development needs to be investigated.

Chapter 2 Literature review: effects of demographic and input factors on language development

2.1 Introduction

The following is a review of some of the major demographic factors considered to influence language development and thoughts on how they may function in the context of *An Ghaeltacht*. Table 2 presents details of cultural contexts of the studies cited in this chapter including: language, country and other cultural information.

2.2 Birth order and language development

It is a common perception that later born children are relatively slow to start talking and also, that this is because older siblings do a lot of the talking for them. Although higher birth order is ‘commonly believed to lead to speech and language delay, ... (its) contributory role has never been proved’ (Berkowitz, 2000, p.55).

The studies that have found a difference related to birth order show, in general, that first born children tend to show quicker development of vocabulary and syntax (Armor, 2001; Berglund, Eriksson & Westerlund, 2005; Fenson et al., 1994; Pine, 1995; Bates, 1975; Kern & Gayraud, 2007; Bornstein, Leach & Haynes, 2004, Reilly, Wake, Ukoumunne, Bavin, Prior, Cini, Conway, Eadie & Bretherton, 2010). Nevertheless some studies find no difference related to birth order and others find that later born children tend to show quicker development in particular areas such as conversational skills and pronouns (Bernicot & Roux, 1998; Hoff Ginsberg, 1998). There is some evidence that these differing results may be in part related to differing methods of data collection.

Bornstein, Leach and Haynes (2004) compared vocabulary development in first and later born children using two methods with the same group of participants: parental report and spontaneous language sampling. Parental report reflected quicker development in first born children than in later born children. When spontaneous data were analysed it was established that the vocabulary development of first born children was equal to that of later born children. Formal assessment and parental report measures usually return a first born advantage in speed of general language development (Reilly et al., 2010). This is found particularly in vocabulary development (Armor, 2001; Berglund, et al., 2005; Fenson et al., 1994; Pine, 1995; Bates, 1975; Kern & Gayraud, 2007; Bornstein, Leach & Haynes, 2004) and also in grammatical development (Kern and Gayraud, 2007; Fenson et al., 1994). Informal assessment including spontaneous language sampling often return equal language development in first born and later born children (Oshima-Takane, Goodz and Derevensky, 1996; Hart & Risley, 1995; Bornstein, Leach & Haynes, 2004). Although first born children have also been found to develop quicker in studies using informal assessment methods, in certain areas of language such as vocabulary (Hoff Ginsberg, 1998) and syntax (Bernicot & Roux, 1998; Hoff Ginsberg, 1998), later born children have been found to have a tendency to develop quicker in conversational skills (Bernicot & Roux, 1998; Hoff Ginsberg, 1998) and pronouns (Oshima-Takane et al., 1996).

It may be the case that parents' reports of children's language development may be significantly influenced by the home environment. Later born children experience more competition for communication space than young first born children who have the benefit of a period of being only children. Parents, therefore, may not have as much opportunity to notice the language abilities of their later born children. Additionally, it is possible that first born children, having had more experience without a sibling, tend to be more adept at interaction with adults on a one-to-one basis and are therefore also at an advantage in formal testing situations.

Nevertheless, it appears that first born children may have a slight real advantage in rate of development in the areas of vocabulary and syntax and later born in the areas of pronouns and conversational skills at least until later in childhood when each group may catch up on the other.

2.2.1 Possible reasons for a first born advantage.

First born children are ‘only children’ for at least part of their lives. In this period they have greater opportunity to experience adult speech directed at them and greater opportunity for one-to-one interaction with their caregivers than later born children ever have. Later born children on the other hand never have this period of being the sole recipient of child-directed speech. Parents tend to divide their talking between their children, producing the same amount of speech whether interacting with one or two children (Hart & Risley, 1995; Jones & Adamson, 1987; Blake, 1981). Hart and Risley (1999) had observers audio-record and write contextual notes on the activities and talk of a young child and those who interacted with him or her in 42 families for an hour each month over two and a half years. They found that first born children experienced more parent speech directed solely at them between 11 and 19 months than did later born children. And it is not quantity alone which differs. The content of mothers’ child-directed speech also differs depending on whether they are engaged in dyadic or triadic interaction. Oshima Takane & Robbins (2003) video recorded 14 secondborn children in two 25 minute free play sessions: one with their mothers and the other with their mothers and older siblings. When talking to more than one child, mothers’ talk was found to centre on activities and social interaction whereas when talking to just one child, mothers tended to use more metalingual language (Oshima Takane & Robbins, 2003). Examples of metalingual language are as follows: language which requests a response (e.g. What’s this?) and language which imitates or comments on the child’s previous utterance (Yes that’s a cat –in response to “cat”) (Oshima Takane & Robbins, 2003). Another difference is that later born children also receive input from older siblings, something the first born child does not experience. However, the speech older siblings use to address young children was found to be different from input provided by mothers in

two main aspects: (i) it served more social regulatory functions (Oshima Takane & Robbins, 2003),, and (ii) it was structurally less complex and used a smaller vocabulary (Hoff-Ginsberg & Krueger, 1991). This is significant because research has found a relationship between the proportion of mult clause sentences in the speech children heard and in the their output (Huttenlocher, Vasilyeva, Cymerman & Levine, 2002). The different input experienced by first and later born siblings may account somewhat for a slight first born advantage in vocabulary and syntax.

However, the differing language learning environment directly related to a child's position in the family may not be the only reason for the slight first born advantage often evident in the literature. Across the population, later born children are, of course, more likely to come from a big family than are first born children. Bigger families correlate positively with low socioeconomic status (Blake, 1992) and even low IQ in parents (Rodgers, Cleveland, van den Oord & Rowe, 2000). Low SES and low IQ are risk factors for slower language development (Hart & Risley, 1992; Hoff, 2005). Therefore, in the research comparing first and later born children from different families without matching for SES and parental IQ, results might have been contaminated by those factors (Page & Grandon, 1979). In other words, across the population, later born children may be more likely to develop language at a slower pace, not because of their position in the family but because of genetic and social factors.

2.2.2 Possible reasons for a later born advantage

Dunn and Shatz (1989) suggested that later born children may not be simply delayed relative to their first born peers but that they may develop various skills at different rates or in a different order as a result of the kind of language learning experiences which are available to them. Hoff-Ginsberg (1998) found that first born children were more advanced in lexical and grammatical development and later borns in conversational skill. Specifically, it was found that later borns were less likely to produce non-contingent responses in conversation. Oshima-Takane et al. (1996) found a

later born advantage in pronoun development. These studies indicate that later born children may develop a different style of language learning due to a different environment. Goldfield and Reznick (1990) suggested that first borns tend to have a more referential (object-oriented and, as a result, noun-focused) style of language acquisition while later borns have a more expressive (people-oriented and, as a result, verb-and-pronoun-focused) style. This may account somewhat for first borns' lexical advantage.

Hart and Risley (1999) found that later borns have more exposure to conversation among others. Perhaps this exposure along with increased experience of communicating with a parent whose communication time and attention is in high demand enables later borns to develop conversation skills earlier than first borns. Oshima Takane et al. (1996) also argued that overheard language is important for development and that the greater exposure to overheard language enjoyed by later born children may contribute to their speedier pronoun development. Perhaps later born children hear more use of third person pronouns in talk directed at them simply due to the almost constant presence of another person. It is possible that even second person pronouns may be more used and used with greater emphasis in parent speech in the presence of more than one child for the purposes of differentiation between children.

Much of the research mentioned heretofore was carried out with children younger than 3 years. As the major difference in language learning environments is in the particularly early years (i.e. the period before a sibling arrives in the first born's life) the effect of position in the family may peter out as children mature (Hoff-Ginsberg, 1998). Berglund et al. (2005) found that first borns were quicker to reach the 50 word milestone than later born children but that 'the effect of birth order (was) limited to the onset of language production' (p.490). Furthermore, Tomblin (1990), controlling for family size and SES, found no evidence that birth order affects the likelihood of language impairment among 7 and 8 year olds.

Further, most of the research on the relation between birth order and language development has been done with majority language speaking children in urban areas in the US and to a lesser extent in Canada, the UK, Sweden and France. The situation in bilingual minority language speaking, rural west of Ireland may be very different.

2.2.3 Birth order effects in *An Ghaeltacht*.

Apparent later born disadvantage may be reduced in *An Ghaeltacht* because the influence of an SES and family size correlation on birth order effects may be less significant in *An Ghaeltacht*. In general, larger families are more likely to have lower SES parents than higher SES parents. This is true even in Ireland which, historically, is synonymous with big families. However, cultural difference may mean that this relationship is weaker in Ireland than in some other countries. The relationship is likely to be further reduced in the rural west. The 2011 census in Ireland showed that rural families were larger on average than those in urban areas and also that families in the north and west of the country were on average larger than those in the South and East. In the rural west, later born children may be less likely to belong to low SES classes than in for example the urban east or other urban populations on which studies of birth order effects have been carried out. Therefore the proportion of apparent later born disadvantage which results from the probable greater likelihood of later borns belonging to lower SES families may not be as considerable in Ireland and especially in the rural west – the geographical area of this study.

Alternatively, any later born disadvantage found in monolingual communities may be exacerbated in *An Ghaeltacht*. Later borns may be more exposed to the majority language at a younger age and this may lead to later borns experiencing a more severe version of subtractive bilingualism than first borns. In *An Ghaeltacht*, anecdotal evidence (Lenoach, Ó Giollagáin & Ó Curnáin, 2012) indicates that older siblings often bring home the influence of the majority language from school and the wider community and so, later borns are more exposed to the majority language at

a younger age. Similar phenomena have been found in other bilingual communities. In Korean-American communities, it has been found that older siblings bring the majority language (English) home from school (Shin, 2005). In Spanish communities in the U.S. it has been found that sibling negative attitudes to the minority language can decrease the language's value (Pearson, 2007). In bilingual families of many different cultural and linguistic backgrounds later born children have been found to be less likely to speak a minority language than first born children (Stevens and Ishizawa, 2007; Macleroy Obied, 2009). A later born disadvantage in the development of vocabulary and grammar may therefore be exacerbated in the minority language context.

Finally it may be the case that birth order effects are, in general, reduced. Most research into birth order effects on language development has been carried out in urban centres. In the United States, it was found that urban dwellers live farther from relatives than do rural dwellers (Amato, 1993). This is also likely to be the case in Ireland as there is higher migration into cities than out of cities or between rural areas. Therefore, at least one of the parents of families in rural areas are more likely to have grown up there and have family nearby than parents in urban areas. An increased interaction with extended family in rural settings may dilute the effects of birth order present in a typical urban relatively insular nuclear family.

2.3 Gender and language development

Gender is another one of the factors traditionally thought to affect language development. It is widely assumed that boys develop language slower than girls (Gleason & Ely, 2002). This belief is so prevalent that it has even been shown to negatively affect identification of language difficulties in boys and result in reduced access to services. In a study of primary care physicians' management of developmental delays, Sices, Feudtner, McLaughlin, Drotar and Williams (2004) found that a girl was 60% more likely than a boy to be referred for an audiological assessment following a mother reporting an expressive language delay to the family doctor.

Much research has investigated the presence and scale of a gender effect on language development. Following a narrative review of the literature, Maccoby (1966) concluded the following about girls: “they say their first word sooner, articulate more clearly and at an earlier age, use longer sentences and are more fluent”. Subsequent studies endeavoured to provide a more precise analysis of the influence of gender on language development. Maccoby and Jacklin (1974) list 217 test results in 98 studies related to sex differences in verbal ability. They found that the majority (140 results) returned no statistically significant difference between the sexes. Seventeen results even found a male advantage. The remaining 60 results did show a statistically significant female advantage, however the portion of variance in language development accounted for by gender was very small - only about 1%. Other meta-analyses have returned similar slight advantages for girls (Hyde, 1981; Hyde & Linn, 1988). More recent studies have corroborated the finding of an advantage of females over males (Huttenlocher, Haight, Bryk, Seltzer & Lyons, 1991; Fenson et al., 1994; Bornstein & Haynes, 1998; Bauer, Bornstein, Leach and Hayes, 2004; Szagun, Steinbrink, Franik & Stumper, 2006; Özçalskan & Goldin-Meadow, 2010; Zambrana, Ystrom & Pons, 2012).

A female advantage in rate of language development may be biological (Huttenlocher et al., 1991; Fenson et al., 1994; Gleason and Ely, 2002; Bornstein et al., 2004). If so, it can be expected to be the same cross-culturally. However, this female precocity is not universal. It was not observed in studies of Swedish speaking children (Eriksson & Berglund, 1999) nor in bilingual Spanish and English speaking children (Jackson-Maldonado, Thal, Marchman, Bates & Gutiérrez-Clellen, 1993). The gender effect may therefore be at least partly cultural in origin. It may be associated with the kinds of play in which girls and boys are encouraged to partake (O'Brien & Nagle, 1987; Fenson et al., 1994; Leaper & Smith, 2004). For example, tea-party play is associated with more talking than vehicle play. Alternatively, it may be that mothers' interaction styles with their infant daughters differ from their interaction styles with their infant sons and that

this affects later language development (Karrass, Braungart-Rieker, Mullins, & Lefever, 2002). Indeed, Hyde and Linn (1988) found a reduced gender effect in United States and Canada post 1973 and attributed this to changing gender roles. The relative contribution of cultural and biological factors to this gender effect is uncertain. It is therefore necessary to investigate the effect of gender on language development in Irish speaking children in rural Ireland. In her study of the language development of Irish speaking toddlers, O'Toole (2009) found that girls scored marginally higher than boys in grammatical development but the difference was not statistically significant. Further research is needed to thoroughly investigate this trend with regard to Irish speaking children.

Much of the aforementioned research investigates the language of infants, toddlers and younger preschool age children (Huttenlocher et al., 1991; Fenson et al., 1994; Bornstein & Haynes 1998; Bornstein et al., 2004; Szagun et al., 2006; O'Toole, 2009). In older children the gender effect may be different. It has been found by some that gender difference reduces after 2 or 3 years of age (Huttenlocher et al., 1991; Leaper & Smith, 2004). Nevertheless, Maccoby (1966) found that females persisted in holding an advantage in rate of vocabulary development until just prior to school age and, similarly, Bornstein et al., (2004) found that the female advantage continued through to the 5th year of life.

2.3.1 Gender effects in a context of language change

The research on a gender effect on language development has been carried out mostly in monolingual majority language contexts. The effect of gender on language development may appear very different in contexts of rapid language change.

It is well established that women tend to be forerunners of language change. Mesthrie et al., (2000) report that Fischer (1958), Labov (1972), and Trudgill (1974) all found that females use more prestige forms in their speech than males. Eckert (2000) found that boys in Detroit were more

conservative than girls when it came to pronunciation innovations. In further research on English language speakers, women also seem to lead the way in the acquisition of new prestige forms from outside the speech community (Cheshire, 2004). A similar phenomenon has also been found in *An Ghaeltacht*. Ó Curnáin (2009; 2012) observed that morphological and phonological movement towards English and, to a lesser extent, towards standard Irish tends to be more prevalent amongst women.

It has been documented that children as young as 3 and 4 years of age participate in language change –showing sensitivity to and use of social and style variation in their language (Romaine, 1978; Purcell, 1984; Roberts & Labov, 1995). It is also recognised that young children show tendency to model their behaviour on the adult versions of their own gender (Bussey & Bandura, 1999; Martin, Ruble & Szkrybalo, 2002) Gender schema theory proposes that children learn about gender roles from experiencing their culture and that traits that are associated with their own gender take on more value than those relevant to the other gender (Liben & Bigler, 2002; Martin & Ruble, 2004). We may therefore conjecture that a gender effect on the rate of movement along the language shift continuum is evident even in young children. Given that the most modern version of Irish is a relatively reduced version of the language and that females are often found to be quicker to use new forms than males, we may see a gender effect on language development which is different among Irish speaking children in comparison to among majority language speakers. In other words, the Irish language development of girls may be slower than that of boys.

Ó Curnáin (2012) reports findings from Pétarváry, Ó Curnáin, Ó Giollagáin and Sheahan (forthcoming) of a possible association between gender and the appropriate use of initial mutation to mark inflection. The reduced use of initial mutation to mark inflection is one of the characteristics of the kind of Irish spoken by the youngest generation. On average, girls' language was found to be more reduced in this regard than boys' language. In other words, girls tended to use less initial mutation to mark inflection than boys. Sample

sizes in this study were small but this may be an indication of a potentially significant gender difference.

2.4 Socioeconomic status (SES) and language development

Law, Todd, Clark, Mozz and Carr (2013) reviewed studies on the relationship between language development and SES and concluded that language development is more a function of environmental factors (influenced by SES) in the early years and that genetics becomes increasingly important as children move into middle childhood and adolescence.

The most reliably observed difference between high and low SES children is in vocabulary development (Hoff, 2006). In one highly regarded longitudinal study (Hart and Risley, 1995) of 42 families, in which talk directed at children between the age of 10 and 36 months was analysed in detail, it was found that SES accounted for 36% of variance in vocabulary size between high and low SES children at 3 years of age. This SES difference in child vocabulary size was considered to be due to the amount of child directed talk differing enormously between low and high SES groups. SES was based on parental occupation in this study and was also found to be strongly associated with mother's years of education. Other studies (which base SES on maternal education) also found that higher SES children had greater vocabularies than the lower SES children with the extent of SES-related differences depending on the range of SES groups in the sample studied (Rescorla, 1989; Arriaga, Fenson, Cronan & Pethick, 1998; Dollaghan, Campbell, Paradise, Feldman, Janosky, Pitcairn & Kurs-Lasky, 1999).

Little difference has been found in simple grammar but a significant difference has been found in frequency of complex syntax: higher SES children tend to produce more complex syntax than lower SES children (Arriaga et al., 1998; Huttenlocher et al., 2002).

In studies which investigate the relationship between SES and language development it makes intuitive sense that SES be defined by maternal education as the mother generally spends the most time with the child and is therefore likely to have the greatest influence on their language development. Further, a background measure, and one which is generally quite permanent after a certain age, like education as opposed to a more transitory measure like occupation, intuitively, is likely to be more indicative of behaviour. Stanton-Chapman, Chapman, Bainbridge and Scott (2002) have found that maternal education being low when a child is born is an important risk factor for language impairment in that child at school age.

2.4.1 Differences in input across SES groups.

Stanton-Chapman et al., (2002) investigated the possible reasons for SES related differences in child language development (Hoff, 2006). It seems that SES related differences in language development reflect differences in input rather than just differences in ability. This is also shown in Hart & Risley (1995).

A review of the literature on the influence of SES on language environments and child language development (Hoff, Laursen & Tardif, 2002) found consistent evidence across cultures that relative to lower SES mothers, higher SES mothers talk more to their children. It is not only quantity which differs between SES groups but also quality. Lower SES mothers use language for the purpose of directing children's behaviour more than higher SES mothers do. Higher SES mothers do more eliciting conversation from their children than lower SES mothers.

It has been argued that the link between low SES and delayed early language development may be due to the association of poverty with chaos (mainly household disorganisation) and chaos with reduced parenting. In other words, chaos associated with poverty may be an important reason for reduced parenting and therefore input for low maternal education children

(Vernon-Feagans, Garrett-Peters, Willoughby, Mills-Koonce & The Family Life Project Key Investigators, 2012).

Nevertheless, a difference has even been found in child-directed talk from mothers in the upper and lower end of the higher SES groups. Hoff-Ginsberg (1991; 1998) compared the conversations of college-educated and high school-educated mothers with their 2-year-old children and found that, relative to high school-educated mothers, the college-educated mothers used a wider vocabulary, were less directive, asked more questions, produced more contingent responses to their children's talk and in general talked more themselves.

2.4.2 Differences in input: an explanatory theory

SES related differences in children's language development may be due to differences in the target language style (restricted or elaborated) and not just differences in child directed speech. Low and high SES children may, in fact, be learning two different language styles. Bernstein (1970) suggests a correlation between SES group and the use of an elaborated or restricted code: lower SES groups using only or mostly a restricted code and higher SES groups using both restricted and elaborated. According to Atherton (2013), the restricted code is used in 'situations in which there is a great deal of shared and taken-for-granted knowledge in the group of speakers. It is economical and rich, conveying a vast amount of meaning with a few words, each of which has a complex set of connotations and acts like an index, pointing the hearer to a lot more information which remains unsaid.' On the other hand, 'the elaborated code spells everything out, not because it is better, but because it is necessary so that everyone can understand it. It has to elaborate because the circumstances do not allow the speaker to condense (Atherton, 2002). This functional difference in language style may be a reason for the SES related structural difference in children's language input. If the model or target for language learning is different, it is possible to argue that comparing language development across SES groups is inappropriate. However, this difference in target language style means a

difference in children's opportunities for interaction and in the availability of language input. Therefore, not only does children's output tend to be different according to SES group but also, in some elements such as vocabulary and frequency of complex syntax, it tends to be slower to develop (Hoff, 2006). On the other hand, the difference in language style or function does not seem to have consequences for the development of simple grammar which is quite similar across SES groups (Noble, Norman & Farah 2005).

2.4.3 SES effects on language development in *An Ghaeltacht*

SES effects on language development may be different in the bilingual minority language environment of *An Ghaeltacht*. Lareau (2003) found that SES differences in child rearing practices are found in each of four areas: perceptions of parental responsibilities, language patterns, children's leisure activities, and relationships with social institutions. Higher SES parents make more deliberate parenting choices (Lareau 2003; Cheadle & Amato, 2011). Lower SES parents tend to provide the necessary conditions to allow natural growth in their children but do not interfere further (Lareau, 2003). A deliberate decision to avoid language mixing in child directed Irish language may, therefore, be more frequent among higher SES parents, benefiting the Irish language development of their children. On the other hand, parents who speak Irish to their children but who are themselves second language speakers of Irish may be more frequent in higher SES groups as academic success is more likely in higher SES groups (Bodovski & Farkas, 2008) and second language Irish is generally learned formally. A second rather than first language model may negatively affect the Irish language acquisition of these children.

2.5 Quantity of input and language development.

Studies of extreme cases of child neglect (Curtiss, 1977; Skuse, 1993) have given support to the theory that some language input is necessary to allow the acquisition of language. However, these children's lack of language could have been at least partially due to physical and emotional neglect and abuse. It is noteworthy that deaf children who are unable to access any kind of language (including sign) input do not develop language (Curtiss, 1989). This confirms that language is not acquired in the absence of language input, even when emotional and physical neglect are not factors.

Further, even in the context of a typical childhood, it seems that the quantity of input influences the rate of language acquisition. Hart and Risley (1995) have found that the quantity of input has an impact on vocabulary development and the use of complex syntactic constructions. The importance of the role of quantity of input has been incorporated into theory of monolingual and bilingual language acquisition, not only in the basic acknowledgement that input is necessary (Skinner, 1957; Chomsky, 1981), but further, in the consideration of the effect of quantity of input on rate of acquisition (Cummins, 1979; Elman, 2003; Gathercole, 2002; 2007; Gathercole & Hoff, 2007; Maratsos, 2000; Maratsos & Chalkley, 1980; Marchman & Bates 1994; Paradis & Genesee, 1996; Paradis, Tremblay & Crago, 2008; Tomasello, 2003). It is theorised and exemplified that various grammatical structures are acquired only when minimum amounts of input are amassed (Gathercole, 2002; Gathercole & Thomas, 2009; Marchman & Bates, 1994; Maratsos, 2000; Oller & Eilers, 2002). Constructivist language acquisition theory proposes that a child learns, for example, the SUBJECT VERB OBJECT transitive construction in a piecemeal fashion. First they learn frozen phrases such as "I'm pushing it", "I'm eating it". The child will then schematise across these frozen phrases to form a lexically specific construction "I'm Xing it" into which he can insert the name of any action he is doing. Children require a critical mass of input data to analogise and thereby generate systematic language (Ambridge & Lieven, 2011).

The quantity of input is a more salient factor in bilingual language acquisition than in monolingual language acquisition for two reasons. Firstly, the quantity of input in a particular language varies more for bilingual than for monolingual children. Secondly, bilingual children are likely to have less input in each of their languages than monolingual children (Paradis & Genesee, 1996). Input in each language is, therefore, closer to a minimum amount (or critical mass) of input necessary for typical development in each language. When the quantity of input in a language drops below this threshold, the acquisition of grammatical structures is delayed (Blom, 2010; Barriere, Blum, Gillig & Meisels, 2011).

The threshold amount of input that allows typical language acquisition is not yet known. The recent literature on bilingual language development has emphasised the importance of measuring the proportion of input in each of the child's languages (Gathercole & Thomas, 2005; Oller & Eilers, 2002; Pearson et al., 1997). As bilinguals who have about 50% of their input in each language can acquire constructions of those languages at the same rate as monolinguals (Gathercole, 2002; Gathercole & Hoff, 2007), it seems that the necessary or threshold amount of input may be quite low relative to the quantity of input typically amassed by monolinguals. Perhaps children who are exposed to 40% of their input in one language acquire grammatical constructions at similar ages as those exposed to 50%. Perhaps those who are exposed to 30% do also and perhaps not. This is not yet known.

It is important to consider that this threshold of proportion of input may not be the same for all language combinations. It is likely that the level of the threshold is affected by the relative difficulty and sociolinguistic status of the child's two languages.

2.5.1 The effect of the relative difficulty of acquisition of languages on the quantity of input necessary.

It has been found that languages are not equally easy to learn (Yip & Matthews, 2007; Paradis, Nicoladis & Crago, 2007; Paradis, Tremblay &

Crago 2008). This inequality in ease of acquisition is particularly relevant in the case of translation equivalent grammatical constructions across languages (Gathercole & Thomas, 2009). All else being equal, when more complex forms are competing with simpler forms, the latter prevail (at least temporarily) –whether this is within or across languages. So, even if a child receives a relatively large amount of input in language A, a particular construction may be more easily expressed in language B and so may be acquired earlier making the equivalent language A construction somewhat redundant. An obvious example from the Irish and English language pair is the plural morpheme. In English, most nouns are pluralised by adding one of two allomorphs, depending on the phonetic environment: an /s/ or /z/ sound. This morpheme is, therefore, relatively easy to acquire. In Irish, however, there are no such regular plural allomorphs but many different ones including internal and final allomorphs. Young children can often be heard pluralising an Irish word with this /s/ or /z/ allomorph rather than the appropriate Irish one. Swaps like these may be maintained in the language of a child growing up in a bilingual community which readily understands and accepts such language mixing. More input in the more complex language may be necessary to compensate somewhat for the advantage enjoyed by the language whose constructions are more easily learned.

2.5.2 The effect of the relative sociolinguistic status of languages on the quantity of input necessary.

The two languages of a bilingual do not often have equal sociolinguistic status. In order to develop each of their languages at a similar rate to monolinguals, bilingual children appear to need a greater proportion of their input in the minority language than in the majority language (Pearson et al., 1997; Vihman, Lum, Thierry, Nakai & Keren-Portnoy, 2006). It may be true that more input is actually necessary in the minority language as children from as young as three, may be aware that the majority language is more useful i.e. more people understand it and the majority language may often be used by parents and other family members when talking about topics (e.g. tv/game characters, particular foods, baby and play equipment) and in styles

(e.g. silly talk and jokes, songs and rhymes) which are particularly attractive to children. Alternatively, it is possible that it only appears that more input is needed in the minority language because our input measurement instruments are not sufficiently sensitive to accurately measure input in a minority/majority language pair. These instruments may not reflect true input levels, failing to sufficiently acknowledge indirect input such as language use in the child's environment and the use of language mixing when the minority language is spoken but none or not as much when the majority language is spoken. So, it seems that input of more than 50% in the minority language may be needed for a typical (or optimal) rate of development in the minority language whereas, actually, because the majority language is so pervasive, parents and caregivers may need to work at providing more input in the minority language than the majority language just to reach a balance across input in the two languages.

2.6 Quality of input and language development

In the study of bilingual language acquisition, measuring the quantity or proportion of input in each language is necessary. In minority language acquisition in a bilingual context, incomplete acquisition and attrition are also important factors to consider. In order to fully understand minority language acquisition in a bilingual context we must also understand young speakers as being part of a bilingual continuum spanning generations: it is becoming more apparent that the quality of the input language (i.e. the language of the parents) warrants careful analysis (Domínguez, 2009). In this case the “quality” of the input language refers to its syntax and morphology. The quality of the input language is interesting because it is an important element of the model for language acquisition. Pires and Rothman (2009) advocated examination of the quality of the input as an essential part of the study of minority language acquisition when they found that incomplete acquisition alone could not explain Brazilian Portuguese and European Portuguese heritage speakers' divergent acquisition of inflected infinitives. They proposed a ‘missing input competence divergence’ to explain their data (Pires & Rothman, 2009, p.212). Evidently, there are

cases when children do not develop a certain grammatical form simply because that form is not present in the input (Montrul, 2008). Similarly, novel forms found in bilinguals' output can be maintained and passed on to future generations (Cornips & Hulk, 2006).

There are not many language acquisition studies which have actually examined the quality of input from the children's parents (Domínguez, 2009). The two which are described here both examine English-Spanish bilinguals. Paradis and Navarro (2003) examined the language of English-Spanish bilingual children and their parents for crosslinguistic influence on subject realisation in Spanish. It appeared that crosslinguistic influence may have been present in both the parents' and the children's Spanish. However, in the case of the children, at least, this was inconclusive as these apparently crosslinguistically influenced forms also existed in their input. Therefore, the question related to how much the children's English was influencing their Spanish and how much they were simply acquiring these forms from their parents' language remains unanswered. Similarly, Casielles, Andruski, Kim, Nathan and Work (2006) found that some of their child participants' "non-standard" linguistic properties could be explained simply by listening to their parents' language rather than by crosslinguistic influence, incomplete language acquisition or language attrition. These studies highlighted that it is important to look at the features or quality (as opposed to quantity) of input. The difference between the children's form of language and the "standard" (i.e. the form of language more familiar to the researchers) may be due, at least partly, to the language used by their parents (and previous generations) also being different from this "standard".

The way in which children learn a language when it is changing so rapidly that the parents' language does not provide consistent input has been little investigated. How is children's language acquisition affected by input which is inconsistent? Variation has been largely ignored in work on syntactic theory (Hudson, 1997) and therefore in work on the theory of language acquisition based on syntactic theory (Henry, 1998). From the theoretical standpoint of Universal Grammar, Henry (1998) considers the effect of

variation on language acquisition in two main contexts. She considers how language acquisition is affected when faced with multiple dialects in the input and also how it is affected when faced with optionality in a single dialect. In Henry's view, multiple dialects in the input do not result in multi-dialectism. Children appear to form a single grammar incorporating elements of the different grammars in the input (Henry 1998). Often, as languages change, there are periods in which it is optional which of two or more alternative grammatical forms is used. When such optionality exists in a single grammar or dialect in the input, children generally maintain this optionality in their output (Henry, 1998). Children tend to acquire variable forms at an early stage. The children's output also reflects the proportion in which the forms occurred in the input to which they were exposed (Henry et al., 1998). Historically, languages tend to move from optionality towards maximally constrained grammars (Kroch, 1989, 1995). Therefore, it is clear that output does not have to include all the input, i.e. that output does not always maintain the optionality of the input. For example, although present in the input, neither the dialects/idiolects of occasional visitors nor speech errors are incorporated into children's grammar.

In order to make language learnable, it seems that children must deal with inconsistency in the input on the basis of frequency (Henry, 2002). It is possible that during the process of language acquisition all inconsistencies in the input are dealt with in a similar manner whether that inconsistency is due to speech errors, multiple dialects or idiolects, or optionality in a single dialect. If there is sufficient evidence in the input for two options then optionality is incorporated into the linguistic competence of the new generation. If not, then one variant is not acquired expressively and the other is. The element which is not acquired expressively may still be acquired receptively (Henry, 1998). There may also be an intervening stage where both elements are acquired expressively but one is used only when clarification or communication breakdown repair is necessary. Finally, if there is sufficiently little evidence in the input, like in the case of a speech error, an element may not be acquired at all. Markedness (in terms of

Universal Grammar) and functionality may also play roles in determining which option is ignored and which acquired (Wilson & Henry, 1998).

Finally, it seems that the greater the inconsistency in the input, the more challenging it is to acquire the language. In a study of Welsh language acquisition, Thomas and Gathercole (2007) found that inconsistency in the parents' grammars further complicated a language which was already replete with grammatical exceptions. They also suggested that the apparently protracted development of particular grammatical systems resulted from this. For example, children were found to be still developing the grammatical gender system marked by mutation at the age of nine. The authors even proposed an alternative to rule-based learning of language to explain how such inconsistent input is acquired: an item-by-item approach in combination with knowledge of proportional frequencies.

Table 2 presents details of cultural contexts of the studies cited in this chapter including: language, country and other cultural information.

Table 2.

Studies cited in Chapter 2: language, country and other cultural information.

Study	Language(s)	Country (and cultural information if available)
Amato, 1993	N/A	U.S. : rural and urban
Armor, 2001	N/A	U.S.
Arriaga, Fenson, Cronan & Pethick, 1998	English	U.S. : Low and middle income
Barrière, Blum, Gillig & Meisels, 2011	Yiddish and English	U.S. : Hasidic community Heritage language acquisition
Bates, 1975	English	U.S.
Berglund, Eriksson & Westerlund, 2005	Swedish	Sweden : Uppsala county
Bernicot & Roux, 1998	French	France
Bernstein, 1970	English	U.K.
Blake, 1981 ; 1992	English	U.S. : 'white' primarily
Blom, 2010	Turkish and Dutch	Netherlands : Low parental education. Immigrant families
Bodovski & Farkas, 2008	English	U.S. : white
Bornstein & Haynes, 1998	English	U.S. Middle class
Bornstein, Leach and Haynes 2004	English	U.S. Middle class
Bussey & Bandura, 1999	N/A	N/A
Casielles, Andruski, Kim, Nathan & Work, 2006	Spanish and English	U.S.
Cheadle & Amato, 2011	'a nationally representative sample'	U.S.: 'a nationally representative sample'
Cheshire, 2004	N/A	N/A
Cornips & Hulk, 2006	Dutch (standard and local dialect)	Netherlands
Cummins, 1979;	French and English	Canada
Curtiss, 1977	English	U.S. : severe mental and physical abuse including isolation
Dollaghan, Campbell, Paradise, Feldman, Janosky, Pitcairn & Kurs-Lasky, 1999	English	U.S. : Suburban, urban, rural
Dunn and Shatz, 1989	English	U.K. : variety of S.E.S. backgrounds
Eckert, 2000	English	U.S. Urban, middle and working class
Eriksson & Berglund, 1999	Swedish primarily	Sweden : a random sample from birth register
Fenson, Dale, Reznick, Bates, Thal & Pethick, 1994	English primarily; 12% also exposed to another	U.S. : S.E.S. above nationally representative levels

Table 2. continued

Study	Language(s)	Country (and cultural information if available)
Gathercole & Thomas, 2009	Welsh and English	Wales : Minority language, rural
Gathercole, 2002	Spanish	U.S.
Gathercole, 2007	Monolingual Spanish; Bilingual Spanish and English Bilingual Welsh and English	U.S. : Urban Wales : Rural
Gleason & Ely, 2002	English	U.S.
Goldfield and Reznick, 1990	English	U.S.
Hart & Risley, 1995	English	U.S.
Hart and Risley, 1999	English	U.S.
Henry, 1998	English, French	Ireland, U.S., U.K., France,
Hoff Ginsberg & Krueger, 1991	English	U.S. : working and middle class , white
Hoff Ginsberg, 1998	English	U.S.
Huttenlocher, Haight, Bryk, Seltzer & Lyons, 1991	English	U.S.
Huttenlocher, Vasilyeva, Cymerman & Levine, 2002	English	U.S. : Caucasian, African-American . Lower and Middle SES.
Hyde, 1981	English	U.S.
Jackson-Maldonado, Thal, Marchman, Bates & Gutiérrez-Clellen, 1993	Spanish and English	U.S.
Jones & Adamson, 1987	English	U.S. : Middle class
Karrass, Braungart-Rieker, Mullins, & Lefever, 2002	English	U.S.
Kern & Gayraud, 2007	French	France
Labov, 1972	English	U.S.
Lareau, 2003	English	U.S. African American and white families
Lenoach, Ó Giollagáin & Ó Curnáin, 2012	Irish	Ireland : Galway Gaeltacht
Liben & Bigler, 2002	English	U.S. : '98% white... virtually entirely ..middle class'
Maccoby, 1966	English	U.S.
Maccoby & Jacklin, 1974	English primarily	U.S. : Mostly white and middle class
Macleroy Obied, 2009	Portugese and	Portugal

Table 2. continued

Study	Language(s)	Country (and cultural information if available)
Maratsos & Chalkley, 1980;	English	U.S.
Maratsos, 2000	English	U.S. : Middle class
Marchman & Bates, 1994;	English	U.S.
Montrul, 2008	Inuktitut, English and French Spanish and English	Canada U.S. Minority language speakers in a bilingual context
Noble, Norman & Farah 2005	English	U.S. : Middle and low SES. African American
Ó Curnáin, 2009; 2012	Irish	Ireland : Galway Gaeltacht
O'Brien & Nagle, 1987	English	U.S.
O'Toole, 2009	Irish	Ireland : Kerry Gaeltacht
Oshima-Takane & Robbins, 2003	English	Canada : Middle class
Oshima-Takane, Goodz and Derevensky, 1996	English	Canada : Mostly middle class, two upper class
Özçalskan & Goldin-Meadow, 2010	English	U.S. : Heterogeneous mix in terms of income and ethnicity
Page & Grandon, 1979	Many different languages	U.S. : national longitudinal study of educational effects
Paradis & Genesee, 1996	French and English	Canada
Paradis and Navarro, 2003	Monolingual Spanish Spanish and English	Spain U.S./Cuba
Paradis, Nicoladis & Crago, 2007	French and English	Canada
Paradis, Tremblay & Crago 2008	French and English	Canada : English language majority city, french mother tongue school
Pearson, Fernandez, Lewedag & Oller, 1997	Spanish and English	U.S.
Pearson, 2007	Spanish and English	U.S.
Pine, 1995	English	U.K.
Pires & Rothman, 2009	Portugese (European and Brazilian)	U.S. , Portugal : Heritage speakers and Monolingual

Table 2. continued

Study	Language(s)	Country (and cultural information if available)
Purcell, 1984	Hawaiian English and American English	U.S.
Reilly, Wake, Ukoumunne, Bavin, Prior, Cini, Conway, Eadie and Bretherton, 2010	English primarily Also other languages	Australia
Rescorla, 1989	English	U.S.
Roberts & Labov, 1995	English	U.S.
Romaine, 1978	English	Scotland
Sices, Feudtner, McLaughlin, Drotar and Williams, 2004	English primarily	U.S.
Stanton-Chapman, Chapman, Bainbridge and Scott, 2002	Primarily English and Spanish	U.S.
Stevens & Ishizawa, 2007	Mixture of language backgrounds including American English, Hispanic and Asian	U.S.
Szagun, Steinbrink, Franik & Stumper, 2006	German	Germany : urban
Thomas & Gathercole, 2007	Welsh	Wales : rural
Tomasello, 2003	English	U.S.
Tomblin, 1990	English	U.S.
Trudgill, 1974	English	England
Vernon-Feagans, Garrett-Peters, Willoughby, Mills-Koonce & The Family Life Project Key Investigators, 2012	English	U.S. : Low wealth, rural African-American and white
Vihman, Lum, Thierry, Nakai & Keren-Portnoy, 2006	English and Welsh	Wales
Wilson & Henry, 1998	English	Ireland
Yip & Matthews, 2007	Chinese and English	China
Zambrana, Ystrom & Pons, 2012	Norwegian	Norway

Note: Only studies which report on data are included in this table.

Chapter 3 A description of the major linguistic features of the Irish language

3.1 Introduction

In this section, an overview of the major linguistic features of the Irish language is provided. As previously noted, the Irish language is changing rapidly. There is not yet a comprehensive account of currently used Irish. Linguistic accounts available (e.g. De Bhaldraithe, 1977; Ó Siadhail, 1989; Ó Curnáin, 2007) primarily or only describe traditional Irish. These accounts were used as a basis for the current description. It is useful to describe traditional Irish as this is the origin of the more modern versions.

A description of Irish phonology was considered to be beyond the scope of this thesis. Raymond Hickey's (2014) book, *The Sound Structure of Modern Irish* provides a useful description of contemporary Irish phonology which may be of particular benefit to those readers of this thesis who are less familiar with spoken Irish.

3.2 Syntax

Verb subject object (VSO) is the usual word order in Irish. For example:

D'ith Deirdre an cáca.

VERB SUBJECT OBJECT

Literal English translation: ate Deirdre the cake

English translation: Deirdre ate the cake

Most of Greenberg's (1963) universals with regard to VSO languages are found to be true in the case of Irish (McCloskey, 2008).

- Universal no. 3. Languages with dominant VSO order are always prepositional.
- Universal no. 6. All languages with dominant VSO order have SVO as an alternative or as the only alternative basic order.
- Universal no. 10. Question particles or affixes, when specified in position by reference to a particular word in the sentence, almost always follow that word. Such particles do not occur in languages with dominant order VSO.
- Universal no. 12. If a language has dominant order VSO in declarative sentences, it always puts interrogative words or phrases first in interrogative word question.
- Universal no. 16. In languages with dominant order VSO, an inflected auxiliary always precedes the main verb.
- Universal no. 17. With overwhelmingly more than chance frequency, languages with dominant order VSO have the adjective after the noun.

3.3 Morphology

Irish is a highly inflected language. Inflections are modifications of words which express different grammatical categories. In highly inflected languages, verbs and nouns are inflected for many different grammatical categories. In Irish verbs can be inflected for tense, mood, aspect, voice, number and person. Nouns are inflected for gender, number and case. Initial sound mutation plays an important role in inflection in the Irish language. Initial sound mutation is also used for other morphological reasons and for syntactic and phonetic reasons. Initial sound mutations include lenition (e.g. indicating past tense: *bris* –*bhris*: break - broke), eclipsis (e.g. indicating location: *i nGaillimh* : in Galway), h preceding initial position vowels (e.g. clarifying the presence of two vowel sounds coming together, one at the end of a word and the other at the beginning of the next: *le hÁine* : with Áine) and t preceding s and initial position vowels (e.g. indicating gender, feminine *an tsaoirse* : freedom; masculine *an t-ábhar* : the subject).

Chapter 3 A description of the major linguistic features of the Irish language

In lenition, plosive consonants become continuants and other consonants become more sonorous or disappear entirely. Lenition is represented in modern orthography by a h following the lenited consonant. The following consonants can be lenited: b, c, d, f, g, m, p, s, t (see Table 3 below). The remaining consonants are not lenited in the dialects studied.

In eclipsis, a voiced plosive becomes nasalised while a voiceless consonant becomes voiced. It is marked orthographically by writing the eclipsing consonant before the eclipsed letter. The following consonants can be eclipsed: b, c, d, f, g, p, t (see Table 3 below). The remaining consonants cannot be eclipsed. Vowels can also be eclipsed.

Table 3. Lenited and eclipsed forms of consonants.

Unmarked consonant	Lenited form		Eclipsed form	
	Phonological	Orthographic	Phonological	Orthographic
B	v	bh	m	mb
P	f	ph	b	bp
D	ɣ / j	dh	n	nd
T	h	th	d	dt
G	ɣ/ j	gh	ŋ	ng
C	x	ch	g	gc
M	v / w	mh	-	-
F	-	fh	w	bhf
S	h	sh	-	-
Vowel	-	-	ɲ / n(vowel)	n-(vowel)

3.4 Communicative Functions

Major linguistic features of the Irish language are categorised from the perspective of communicative functions (for example referring to time, location or possession) rather than categorised by grammatical element. It is

intended that this approach will give an idea of the relative communicative weight of different grammatical elements in the different communicative function categories relevant to the narrative task of the current study. Communicative weight or value refers to ‘the relative contribution a form makes to the meaning of an utterance and is based on the presence or absence of two features: inherent semantic value and redundancy within the sentence utterance’ (VanPatten, 1996, p.24). It is important to consider the relative communicative weight of different grammatical elements because communicative weight appears to control, in part, the order of acquisition (VanPatten, 1996; Tomasello, 2003). A comprehensive account of the Irish language is available in Ó Siadhail (1989). Focus here will be on the linguistic features investigated in this study.

3.4.1 Time

Time vocabulary (e.g. *inné* (yesterday), *ar ball* (a little while ago / from now) and irregular verbs and tense marking of regular verbs) communicate whether events mentioned happen in the past, present or future (i.e. tense) and whether they are discrete or continuous (i.e. aspect). Communicative weight is high here: these elements all have inherent semantic value and none are generally redundant in a sentence utterance.

Irregular verbs

There are eleven irregular verbs. They do not always keep the same root. Table 4 shows some examples of how tense is communicated through this special category of time vocabulary. Verbs can also express different aspects. When present, the dependent form is shown following a forward slash: / .

Table 4. Irregular verbs across tenses.

	Imperative	Past	Present	Future
1	<i>Tar</i> (come)	<i>Tháinig</i>	<i>Tagann</i>	<i>Tiocfaidh</i>
2	<i>Clois</i> (hear)	<i>Chuala</i>	<i>Cloiseann</i>	<i>Cloisfidh</i>

3	<i>Feic</i> (see)	<i>Chonaic / faca</i>	<i>Feiceann</i>	<i>Feicfidh</i>
4	<i>Téigh</i> (go)	<i>Chuaigh / deachaigh</i>	<i>Téann</i>	<i>Rachaidh</i>
5	<i>Abair</i> (say)	<i>Dúirt</i>	<i>Deir</i>	<i>Déarfaidh</i>
6	<i>Tabhair</i> (give)	<i>Thug</i>	<i>Tugann</i>	<i>Tabharfaidh</i>
7	<i>Ith</i> (eat)	<i>D'ith</i>	<i>Itheann</i>	<i>Íosfaidh</i>
8	<i>Déan</i> (do/make)	<i>Rinne / dearna</i>	<i>Déanann</i>	<i>Déanfaidh</i>
9	<i>Faigh</i> (get)	<i>Fuair</i>	<i>Faigheann</i>	<i>Gheobhaidh / faighidh</i>
10	<i>Beir</i> (catch)	<i>Rug</i>	<i>Beireann</i>	<i>Béarfaidh</i>
11	<i>Bí</i> (be)	<i>Bhí / raibh</i>	<i>Tá / bhfuil</i>	<i>Beidh</i>

Tense marking of regular verbs

In order to understand how time is communicated through tense marking of regular verbs, we first need to be aware of the different kinds of regular verbs. Traditionally, verbs in Irish have been divided into categories according to the form of their roots. The root of a verb is its form in the second person singular, imperative mood. Tense is communicated in different ways according to the category of the verb. The following is an overview of these categories.

First conjugation

1. Verbs with roots of one syllable e.g. *mol*, *léigh*, *suigh*.
2. Verbs with roots of more than one syllable and ending in *áil* e.g. *sábháil*, *marcáil*, *vótáil*.
3. A number of other verbs of more than one syllable e.g. *taispeáin*, *tionól*, *céiliúir*.

Second conjugation

1. Verbs with roots of more than one syllable and ending in *(a)igh* e.g. *beannaigh*, *bailigh*, *brostaigh*.

2. Syncopated verbs. Verbs of more than one syllable and ending in:
 - (a)il e.g. *ceangail, oscail, eitel*
 - (a)ir e.g. *bagair, labhair, imir*
 - (a)is e.g. *inis*
 - (a)in e.g. *cosain, aithin, cogain*.
3. A number of other verbs with roots of more than one syllable which are not syncopated e.g. *foghlaim, tarraing, freastail*.

Past tense

Regular verbs are inflected for past tense through lenition of initial consonant of the root when possible e.g. *suigh - shuigh*. In general, in the case of verbs beginning with *f, d'* is also prefixed *fás -d'fhás*. The prefixing of *d'* is optional before *fh* (i.e. lenited *fl*). When a verb begins with a vowel, *d'* is prefixed to the root (*ith -d'ith*).

Present tense

The present tense is communicated by suffixing a morpheme to the root. The form of this present tense morpheme depends on the conjugation of the verb. In the case of verbs in the first conjugation, *(e)ann* is suffixed to the root e.g. *rith - ritheann*. In the second conjugation, *(a)igh* is omitted from the root and *(a)íonn* is suffixed e.g. *ceannaigh - ceannaíonn*. In the case of verbs in the first person singular an alternative ending exists: *(a)im* for verbs in the first conjugation and *(a)ím* for those in the second. This incorporates both tense and person.

Future tense

The future tense is communicated by suffixing a morpheme to the root. The form of this future tense morpheme depends on the conjugation of the verb. In the case of verbs in the first conjugation, *f(a)idh* is suffixed to the root e.g. *déan - déanfaidh*. In the second conjugation, *(a)igh* is omitted from the root and *(e)oidh* is suffixed e.g. *bailigh - baileoidh*.

Continuous action or imperfective aspect

The verbal noun preceded by *ag* is used to communicate continuous action. Depending on the verb, various endings e.g. *(e)adh*, *t* or *(e)ach(t)* are suffixed to the root to form the verbal noun e.g. *fan - ag fanacht*. For some verbs the root is left as it is e.g. *ól - ag ól*.

Also, when a verbal noun is followed by a direct object this noun is usually in the genitive case. When the direct object is a pronoun a construction involving the possessive adjective is used: e.g. *tá sé do/ag mo mholadh* ; translation: ‘he is praising me’.

3.4.2 Possession

Possession is communicated through the use of possessive pronouns, initial sound mutations, prepositional pronoun with the root *le* and genitive inflection (including genitive article agreement) as shown in Tables 5, 6 and 7 below. In terms of communicative weight, all of these communicators of possession have semantic value but initial mutation is somewhat redundant following a possessive pronoun except in the case of the distinction between the third person singular masculine, third person singular feminine and the third person plural.

Table 5. Possessive pronouns and initial sound mutation:

Person	Possessive Pronoun	Initial mutation
1 st person singular	<i>mo</i>	Lenition
2 nd person singular	<i>do</i>	Lenition
3 rd person singular masculine	<i>A</i>	Lenition
3 rd person singular feminine	<i>A</i>	-
1 st person plural	<i>ár</i>	Eclipsis
2 nd person plural	<i>bhur</i>	Eclipsis
3 rd person plural	<i>A</i>	Eclipsis

Table 6. Contrastive form of prepositional pronoun with the root *le*

Person	Prepositional pronoun
1 st person singular	<i>liomsa</i>
2 nd person singular	<i>leatsa</i>
3 rd person singular masculine	<i>leis siúd / leisean</i>
3 rd person singular feminine	<i>léi siúd / léise</i>
1 st person plural	<i>linne</i>
2 nd person plural	<i>libhse</i>
3 rd person plural	<i>leo siúd</i>

Genitive inflection

Examples of how genitive case inflection is used to show possession are given in Table 7 below. Reference is made to the slender and broad distinction in this table and elsewhere in this thesis. The terms slender and broad refer to two categories of vowels. The broad vowels are a, o and u and the slender vowels are e and i. Consonants are either broad or slender depending on their closest vowel.

Table 7. Examples of genitive case inflection used to show possession

Genitive Case Inflection	Irish	English Translation
Initial consonant lenition and final consonant slenderisation comprise the genitive form: <i>Seán</i> → <i>Sheáin</i>	<i>Cóta Sheáin</i>	Seán's coat
Feminine singular genitive form of article and genitive form of noun: <i>bean</i> = woman; → <i>mná</i> = of the woman	<i>Carr na mná</i>	the woman's car (the car of the woman)
Final consonant slenderisation indicates the genitive form: <i>urlár</i> = floor	<i>Clár urláir</i>	a floor board (a board of floor)

Addition of short vowel indicates the genitive form: <i>scoil</i> = school → <i>scoile</i> = of the school	<i>Páiste scoile</i>	a school child (a child of school)
Genitive form of noun <i>teach</i> = house ; → <i>tí</i> = of the house	<i>Bean an tí</i>	the woman of the house

3.4.3 Location

Location is communicated through the use of prepositions and through initial sound mutations showing inflection of nouns for prepositional (dative) case. Table 8 below shows prepositions and corresponding prepositional case inflection. Nouns are inflected for genitive case when immediately preceded by a compound preposition or one of five special prepositions (*chun, cois, trasna, timpeall, dála*). Location is also communicated by use of prepositional pronouns. All communicators of location except initial sound mutations show high inherent semantic value and low redundancy in the sentence utterance. Initial sound mutations are somewhat redundant due to their use alongside prepositions and their semantic value is compromised due to their various meanings in different contexts.

Table 8. Prepositions and corresponding prepositional case inflections

Nouns beginning with consonants	
Preposition	Inflection
<i>de, do, faoi, mar, ó, roimh, trí, um</i>	Initial consonant lenition
<i>ag, as, chuig, go, le, seachas</i>	No inflection
<i>ar, gan, idir, thar</i>	Initial consonant lenition in particular cases
<i>i</i>	Initial consonant eclipsis
Nouns beginning with vowels	
Preposition	Inflection
<i>go, le</i>	h precedes initial vowel
<i>ag, in, ar, as, chuig, faoi, gan, idir,</i>	No inflection

<i>mar, ó, roimh, thar, trí, um</i>			
Nouns following preposition and article combinations			
	b,c,f,g,p	d,l,m,n,r,s,t	Vowels
Preposition + article + noun	Initial sound eclipsis	No inflection	No inflection
	b,c,f,g,m,p	d,l,n,r,s*,t	Vowels
<i>den</i>	Initial sound lenition	No inflection	No inflection
<i>don</i>	Initial sound lenition	No inflection	No inflection
	b,c,f,g,p,d,t	l,n,r,s*	Vowels
<i>as</i>	Initial sound eclipsis	No inflection	Not applicable
<i>san</i>	Lenition of initial f otherwise not applicable	Not applicable	No inflection

* t precedes feminine nouns beginning with s in prepositional case

3.4.4 Plural

Multiplicity of objects, animals, and people is communicated through multiplicity vocabulary (*go leor* (= a lot), *roinnt* (=some), *mná* (irregular plural; =women), *éisc* (irregular plural; =fish)), final morphemic changes and additions on nouns, article agreement, adjective agreement and initial sound lenition in adjectives following masculine nouns ending in a slender consonant in the plural. In certain contexts (cardinal numbers, genitive) the singular form is used in combination with numerals and plural articles to communicate plural. Initial sound mutations can be considered to have relatively low communicative weight in the context of plurals as they have low inherent semantic value and are made somewhat redundant by the preceding plural noun.

Morphemic changes and additions.

Multiplicity is communicated through many different morphemic changes and additions. Patterns are evident but there are many exceptions. Table 9 shows the diversity of plural morphemic changes and additions:

Table 9. Diversity of plural morphemic changes and additions

Morphemic change/addition	Examples	
	Singular	Plural
Slenderisation of final consonant	<i>bád</i> (boat)	<i>Báid</i>
Addition of <i>a</i>	<i>úll</i> (apple)	<i>Úlla</i>
Addition of <i>a</i> after either syncope, broadening of final consonant or changing of internal vowel	<i>scian</i> (knife) <i>roinn</i> (verse)	<i>Sceana</i> <i>Ranna</i>
Addition of <i>t(h)a/e</i>	<i>glór</i> (voice) <i>coill</i> (forest)	<i>Glórtha</i> <i>Coillte</i>
Substitution of <i>(a)í</i>	<i>bealach</i> (way) <i>páiste</i> (child)	<i>bealaí</i> <i>páistí</i>
Addition of <i>a(í)</i>	<i>cáipéis</i> (document) <i>cáilíocht</i> (qualification)	<i>cáipéisí</i> <i>cailíochtaí</i>
Addition of <i>(e)anna</i>	<i>carr</i> (car)	<i>Carranna</i>
Addition of <i>na</i>	<i>trá</i> (beach)	<i>Tránna</i>
Syncope and addition of <i>e</i>	<i>bóthar</i> (road)	<i>Bóithre</i>
Addition of <i>(e)acha</i>	<i>leagan</i> (version)	<i>Leaganacha</i>
Addition of <i>(e)acha</i> after internal changes	<i>Cathair</i> (city) <i>Athair</i> (father)	<i>cathracha</i> <i>aithreacha</i>
Addition of <i>(a)(i)the</i>	<i>oibrí</i> (worker)	<i>Oibrithe</i>
Addition of <i>(a)idí</i>	<i>Fiche</i> (twenty)	<i>Fichidí</i>

There are also plural morphemic changes which are even more irregular. Examples of these are presented in Table 10 below.

Table 10. Example of more irregular plural morphemic changes

Singular	Plural
<i>Ollamh</i> (professor)	<i>Ollúna</i>
<i>Laoch</i> (hero)	<i>Laochra</i>
<i>Sliabh</i> (mountain)	<i>Sléibhte</i>
<i>Foireann</i> (team)	<i>Foirne</i>
<i>Sliocht</i> (descendent)	<i>Sleachta</i>
<i>Ainm</i> (name)	<i>Ainmneacha</i>
<i>Cara</i> (friend)	<i>Cairde</i>
<i>Leaba</i> (bed)	<i>Leapacha</i>
<i>Teach</i> (house)	<i>Tithe</i>

The article *an* changes to *na* in the plural and puts *h* before a noun beginning with a vowel. Finally, plural in the genitive case can be expressed by use of (the plural article and) the singular/plural noun with initial sound eclipsis.

3.4.5 Question

Questions are communicated in the following ways:

A question particle such as *cá*, *an*, *ar*, *nach* or *nár* is used followed by VSO word order including dependent form of verb if available with initial sound mutation when possible (e.g. *Cá raibh tú?* Where were you?). A question particle such as *cé*, *céard* or *cathain* is followed by a relative clause construction (e.g. *Cé atá ann?* = Who is there?). Question particles *cén uair*, *cén fáth* etc are followed by a propositional complement *go* / *gur* + dependent form of verb. In addition, a final rising intonation is used for some questions. Again initial sound mutation stands out as having relatively low communicative weight in the context of questions.

3.4.6 Negative

Negatives are communicated in the following ways:

The negative particle *ní* or *níor* is followed by VSO word order including dependent form of verb if available with initial sound lenition when possible (e.g. *níor chaith sé a bhróga* he didn't wear his shoes). A negative copular sentence is formed as follows: *ní/níorbh* + noun + direct relative clause (e.g. *Ní Eoghan a bhí ann* It wasn't Eoghan who was there.) Initial sound lenition has relatively low communicative weight in the context of negatives,

3.4.7 Relationship between two clauses / clause constituents

When both verbs have the same subject and no direct object and the second verb is a continuous action, simple verbal noun complement clauses are used.

E.g. (1)

Thosaigh siad ag cuartú

Started they searching

They started searching.

When both clauses have the same subject and direct object. A special word order is used in complex verbal noun complement clauses: the object comes before the verb rather than after. The verb in the second clause undergoes initial sound lenition, when possible.

E.g. (2)

Bhí siad in ann é a chríochnú

Were they able it to finish

They were able to finish it

When the second clause gives clarifying information about the first clause, direct and indirect relative clauses are used. The verb in the second clause undergoes initial sound mutation, when possible.

E.g.(3) direct relative:

Sheachain muid an t-ábhar inní a chráigh iad

Chapter 3 A description of the major linguistic features of the Irish language

Avoided we the worry that tormented them
We avoided the worry that tormented them.

E.g. (4) indirect relative:

Chonaic muid an clós a gcoinníonn sí cearca ann
Saw we the yard that keep she hens in it
We saw the yard that she keeps hens in.

E.g. (5) indirect following áit:

Thóg siad teach san áit a raibh siad
Built they house in the place that was(dependent form) they
They built the house where they were.

When explaining a perception, cognition, utterance or emotion, propositional and adjectival complement clauses are used. The verb in the second clause undergoes initial sound mutation, when possible.

E.g. (6) propositional complement clause:

Bhí fhios aige go raibh sé ceart
Was knowledge at him that was (dependent form) he right
He knew he was right.

E.g. (7) adjectival complement clause:

Bhí sí díomách go raibh sí ann
Was she disappointed that was(dependent form) she there
She was disappointed that she was there.

When others' speech is reported directly

E.g. (8)

Dúirt sé “slán!”
Said he goodbye
He said “goodbye!”

Chapter 3 A description of the major linguistic features of the Irish language

When two otherwise independent clauses have a time, place or cause and effect relationship, subordinating conjunctions and adverbial clauses are used.

E.g. (9)

Nuair a bhí sé óg bhí sé saibhir

When that was he young was he rich

When he was young he was rich

E.g. (10)

Bhí sé bocht mar chaill sé a chuid airgid

Was he poor because lost he his money

He was poor because he lost his money

E.g. (11)

Ghnóthaigh sé tuilleadh airgid sula raibh sé sean

Earned he more money before was(dependent form) he old

He earned more money before he was old.

When one clause constituent needs to be emphasised: pseudo cleft constructions are used

E.g. (12)

Céard a bhí ann ach bronntanas ón mbaile

What that was there but present from the home

What was it but a present from home.

3.5 Gender marking: a grammatical element with very low communicative weight

Grammatical gender is arbitrary and not based on semantics and therefore carries very little communicative weight. For example, the Irish translation of the word 'girl' *cailín* is grammatically masculine. In the singular nominative case, when possible, the initial sound in feminine nouns is lenited following the article (e.g. *An bháisteach* = the rain). Again, when possible, the initial sound in an adjective modifying a feminine noun is also

lenited (e.g. *báisteach throm* = heavy rain). In the nominative case, masculine nouns are not marked for gender (*an mála* = the bag) unless they begin with a vowel. In this case t- is prefixed (e.g. *an t-am* = the time). The adjectives which modify masculine nouns are not marked for gender (*an mála trom* = the heavy bag). In the plural nominative case neither nouns nor modifying adjectives are lenited due to gender. In the genitive case following the article, the opposite is the case with regards to lenition. In this case, feminine nouns are not lenited (*gruaig na babóige* = the doll's hair) and masculine nouns are lenited (*gruaig an chailín* = the girl's hair). Also, as evident in these examples, the article *an* is changed to *na* before a feminine noun in the genitive case but not before a masculine noun.

3.6 Relevance to the current study

The relative communicative weight of grammatical and vocabulary elements which express similar communicative functions is relevant to our understanding of the order of acquisition of these elements and to the change in use of these language elements over generations. These are two topics which are particularly relevant to the current study and which will be further investigated in the remaining chapters of this thesis.

Chapter 4 Methodology

4.1 Introduction

The long term aim of the current study is to create an expressive language assessment which is appropriate for use with L1 Irish speaking children. This is particularly necessary for those children in the age group from 3 to 6 as very little is known about Irish language development particularly at this age. Also, at this age, children are developing more language specific structures which require a more language specific assessment. Before such a language assessment can be designed we need to know more about children's language production at different ages including identifying the problem areas on the road to acquisition of mature language.

In order to understand language development in any group of children it is also necessary to collect data on the demographic characteristics which have been shown to affect language development in other languages such as age, gender, birth order and socio-economic status (Fenson et al., 1994; Feldman et al., 2000; Parada, 2013). In bilingual populations it is also necessary to collect data on the quantity of children's input in each language (Gathercole & Thomas, 2005). It is important for us to understand the relationships between these five factors and language development in the unique context of this particular population of L1 Irish speaking children rather than relying solely on what has been found to be the case in other linguistic groups. Finally, because Irish is a rapidly changing language, it is also necessary to gain an understanding of the qualitative aspects of the children's input in this language. The children's input is their model and goal in language acquisition and therefore without knowledge of the quality of the input any understanding of child language development would be seriously lacking. As details of the language spoken by the generation who are providing the majority of input for these children (i.e. their parents' generation) have not

been sufficiently documented it is also necessary to gather data on typical grammatical use in this group.

Described and justified in this chapter are the methodological approach adopted in this study and the methods used for recruitment and selection of participants and for collecting and analysing data. Described also are the characteristics of the child and parent participant groups.

4.2 Methodological approach

In order to explore language development in L1 Irish speaking children this study will employ quantitative research methods. Quantitative research methods allow us to discover which phenomena can be expected in the wider population and which are merely chance occurrences (McEnery et al., 2001). In this study, quantitative analysis allows the investigation of children's and parents' performance on relatively broad language measures and the testing of hypotheses from the literature pertaining to relationships between these language measures and the five independent variables mentioned above: age, gender, birth order, socioeconomic status and proportion input in each language. Language measures investigated through quantitative statistical methods in this study generally needed to be quite broadly defined in order to include sufficient examples. Nevertheless, as in all quantitative studies, these measures need also to be strictly defined (McEnery et al., 2001). As a result, while useful, quantitative statistics alone were not found to be sufficient to tell the rich story of L1 Irish language production and development. To compensate for this a more descriptive approach is also adopted. Broad language production measures and some independent variables are further broken down and analysed in order to provide a more detailed and complete understanding of children's L1 Irish language production.

4.3 Participants

4.3.1 Ethics

Before beginning recruitment the research design was approved by the *National University of Ireland Galway Research Ethics Committee*.

4.3.2 Recruitment of participants

The study was publicised through national Irish language radio and television news programmes (*Iris Aniar, Raidió na Gaeltachta*: November, 2009; *Admhaidin, Raidió na Gaeltachta* and *Nuacht TG4*: October 2010) and an information evening at a community Irish language support centre in *An Ghaeltacht*, Co. Galway (June 2010). Initial contact was made with parents primarily through Irish language medium primary schools and preschools in Category A electoral districts (as outlined in Ó Giollagáin and colleagues *Comprehensive Linguistic Study of the Use of Irish in the Gaeltacht*, 2007). In general, in these Category A districts, 67% or more spoke Irish on a daily basis. In the case of children who were not yet attending an educational institution, initial contact was made with their parents through word of mouth.

4.3.3 Selection of child participants:

Potential child participants were selected from a particular subpopulation of Irish speaking children with parameters defined by inclusion criteria. The reason for this selection method is that Irish speaking children are such a diverse group. Varying dialect and bilingual language background further complicate the significant variation in general and language specific development and demographic characteristics found in a comparable monolingual majority language speaking group of children. Confining incidental selection to a relatively large and homogeneous subgroup of the population facilitates useful generalisation of findings to other members of that subgroup. Parents, teachers and preschool directors provided guidance in the identification of children who were thought to satisfy the inclusion criteria from a) to d).

- a) The children were aged 3, 4, 5 or 6 years of age.
- b) The children were currently being exposed predominantly to Irish.
- c) The children were living in Category A electoral districts⁴ of *An Ghaeltacht* in County Galway, Ireland.
- d) The children had no history of speech and language therapy and their parents were not concerned about their speech, language, hearing or cognitive development.

Information sheets, consent forms and short screening questionnaires on the children's language background and any parental concerns regarding early development were distributed to parents of all children who appeared to satisfy the above criteria. The short screening questionnaires further confirmed the children's suitability for inclusion in the study. This printed material was provided in English as well as Irish and are available in Appendix 1.

Further screening allowed further investigation of the children's fulfilment of inclusion criterion a) to d) and two further inclusion criteria:

- e) The children passed a hearing screening test conducted by the researcher.
- f) The children's performance in the 'non-verbal' core subtests of the *WPPSI -III^{UK}* exceeds one standard deviation below the mean.

Investigation was carried out in three ways:

1. Parents completed questionnaires on their child's language background and early health and development.
2. A hearing screening test was administered with each child individually.
3. Part of the *Wechsler Preschool and Primary Scale of Intelligence – Third Edition UK* (Wechsler, 2002a) was administered with each child through Irish.

⁴ As defined in Ó Giollagáin, C. and Mac Donnacha, S. et al., 2007.

1. Parents were asked to complete questionnaires which included sections on the early health and development of their child. Questions related to pregnancy and birth, motor skills development, eye sight, hearing, other medical details and, particularly, about the development of their child's speech and language. The questionnaires also included a short preliminary section on their child's language background. These questionnaires are provided in Appendix 2. The answers parents provided enabled further examination of the children suitability for the study under inclusion criteria a) to d).

2. Because hearing problems are a risk factor for language impairment, a pure tone hearing screening test was administered with each potential child participant. This direct method of investigation was used because a parental questionnaire alone was found to be an ineffective screening tool for detecting persistent hearing impairment in 4 and 5 year old children in a large Australian study (Hammond, Gold, Wigg & Volkmer, 1997).

Procedure for hearing screening.

The researcher, a qualified speech and language therapist, administered the test after having received the relevant training from an audiologist. Each child's hearing was individually screened using bilateral pure tone testing at 30dB for 500Hz and at 20 dB for 1000, 2000 and 4000 Hz. Children were asked to post a block into a toy post box each time they heard a sound in their earphones. Children were first familiarised with the task by practising it when the earphones were laid on the table and the sound was audible to both the child and researcher. This allowed the researcher to encourage and demonstrate correct participation and to ensure understanding of the task.

The presentation of tones was unevenly spaced in order to ensure that a child who adopted a strategy of guessing when to respond would not be successful. In order to pass, children needed to respond to each test frequency in each ear. Children who did not pass this hearing screening test

were seen two to four weeks later for a repeat screening. Children who did not pass this repeat screening were not included in the study and their parents were advised to seek a full audiological assessment for them.

3. Because language delay often occurs with cognitive delay, Core Performance subtests of the *WPPSI-III^{UK}* were administered with each child. This test was chosen as it was standardised on the appropriate age group and the option to administer Performance subtests alone minimised the influence of language.

Procedure for administering subtests of the *WPPSI-III^{UK}*.

Subtests were administered by the researcher who is a qualified speech and language therapist, trained and experienced in administering and interpreting standardised clinical instruments thereby following the guidelines for user qualifications (Wechsler, 2002b).

Core Performance subtests comprise *Block Design*, *Matrix Reasoning*, *Picture concepts* and *Object Assembly*. In this study, as recommended by Wechsler (2002b), children from 3;0 to 3;11 completed the *Block Design* and *Object Assembly* subtests. Children aged 4;0 and older completed the *Block Design*, *Matrix Reasoning* and *Picture Concepts* subtests. The purpose and procedure of each subtest is outlined in Appendix 3.

Subtests were administered through Irish. As mentioned, the administration of Performance subtests alone minimised the influence of language on test results. Nevertheless, all *WPPSI-III^{UK}* standardisation data were collected from children whose primary language was English. Wechsler (2002b, p.11) recommends that this should be considered in the interpretation of scores of any translated administration of the test.

A scaled score of at least seven on each subtest returned a *Performance IQ* score of 82 for children up to 3 years 11 months and 81 for 4 year old children and older. These minimum scores of a little more than one standard

deviation below the mean were considered to reflect typical development and their attainment fulfilled inclusion criterion f).

4.3.4 Further description of child participant group

Sixty-two children returned signed parent consent forms for participation in the study. Thirty-nine children were included in the final sample. Of the twenty-three children who were excluded, seven were excluded due to failure to fulfil inclusion criteria and sixteen due to failure on the part of the child or parent to complete all tasks. Table 11 presents the details of these reasons for exclusion. Four three year olds did not attempt narration of the stories. Five four year olds did not complete narration of the stories. Two of these four year olds did not attempt to tell a story, one told the story in English and the remaining two began telling the first story and then lost interest. All five and six year olds completed narration of the stories.

Table 11. Reasons for exclusion of twenty-three children from the final sample of children included in the study.

	Reason for exclusion				
	Failure to fulfil inclusion criterion			Failure to complete all tasks	
	Hearing	Cognition	Language development	Narration	Questionnaires
Number of children	5	1	1	9	7

Age.

Summary statistics on the children’s ages in months are presented in Table 12. Measures of central tendency (mean and median) and measures of dispersion (minimum and maximum and standard deviation) provide a picture of the age profile of child participants. The child participant group

comprised thirteen three year olds, fourteen four year olds, nine five year olds and three relatively young six year olds.

Table 12. Summary statistics with regard to age in months for final sample of children included in the study.

		Descriptive Statistic Label	Statistic
Age in months	Measures of central tendency	Mean	53.77
		95% confidence interval for mean	
		<i>Lower bound</i>	50.17
		<i>Upper bound</i>	57.37
		Median	53
	Measures of dispersion	Standard deviation	11.11
		Minimum	37
Maximum		76	

Table 13 presents the proportion of child participants who are included in each category of Birth Order, Gender, Maternal Education and Child's Educational Setting. Maternal Education is a widely used (Ensminger & Fothergill, 2003) proxy for socioeconomic status in children. Further, it has been used effectively as a proxy for socioeconomic status in studies based on the Irish population (Keilthy, 2014; Williams, Greene, McNally, Murray & Quail, 2010).

Table 13. Proportion of children included in each category of Birth Order, Gender, Maternal Education and Child's Educational Setting.

	Birth Order		Gender		Maternal Education		Child's Educational Setting		
	Later born	First born	Female	Male	Low	High	None yet	Preschool	School
Number of child participants	22	17	25	14	10	27	3	20	16
Approximate proportion of child participants	56%	44%	64%	36%	26%	69%	8%	51%	41%

Note: 'First born' children also include only children. A 'Low' level of Maternal Education refers to partial or complete second level education and no third level education. Four mothers with 'Low' education held the Junior Certificate or equivalent, the remainder holding the Leaving Certificate qualification. A 'High' level of Maternal Education refers to at least one year of third level education. Fourteen mothers with 'High' education held postgraduate qualifications i.e. postgraduate diplomas, masters or PhD qualifications. Of the remainder, ten held degrees and three, diplomas only. Two parents did not provide details of Maternal Education.

The categorical measures of Age: 3 years (37-47 months); 4 years (48-59 months) and 5 and 6 years (60-76 months), Birth Order (later born and first born), Gender (female and male) and Maternal Education (Low: less than one year of third level education and High: at least one year of third level education) were tested for difference in distribution across groups of each other.

Table 14 presents the distribution of Age, Birth Order, Gender and Maternal Education groups across levels of each other. For both Maternal Education across Gender categories and Gender across Maternal Education categories, Kruskal Wallis statistics ($H = 4.39^{**}$, $p = .036$) and Jonkheere trend statistics ($J = 2.10^{**}$, $p = .036$) reflect a positive trend i.e. that there may be more children with high Maternal Education among boys and also more boys among children with high Maternal Education.

Table 14. Kruskal-Wallis statistics for Age groups, Birth Order, Gender and Maternal Education across groups of each other.

Categorical test variables	Categorical grouping variables			
	Age	Birth Order	Gender	Maternal Education
Age		.06 (.810)	1.91 (.167)	2.44 (.119)
Birth Order	1.99 (.370)		1.95 (.162)	.09 (.766)
Gender	1.92 (.384)	1.95 (.162)		4.39** (.036)
Maternal Education	2.67 (.263)	.09 (.766)	4.39** (.036)	

Note: ** $p < .05$; * p between .05 and .99.

Child's Educational Setting.

About half the children were attending preschool at the time of recording, about 40% were attending school and the remainder (three children) had not yet begun their formal education and were cared for at home during the day. Two of these children were exposed to French as well as Irish and a minimal amount of English during the day, the third was exposed to Irish with a minimal amount of English. The other children in the sample attended sixteen different class groups in twelve Irish medium educational settings. Although these groups were lead through Irish, children had diverse language backgrounds. Hickey (2007) found a great diversity of language exposure in different early educational settings despite the appearance of uniformity (Hickey, 2007).

Family history of language difficulties.

Seventeen children were first born or only children. Of the remaining twenty-two, five had an older sibling who was currently or who had in the past been identified by a speech and language therapist as being in need of speech and language therapy.

The kind of model of Irish at home is presented in Table 15. All of the child participants in the study were provided with a model of Irish from at least one of their parents. Four of the children had no local native model of Irish at home: their home models were either L2 or of a non-local dialect. Data was not gathered on whether L2 models were local or non-local. Sixteen of the children had mixed Irish language models at home, with at least one parent speaking a non-local or non-native variety of Irish to them. However, even children in these two groups of children were considered to be increasingly exposed to local native Irish models as all but one of them were attending a local educational institution where input was mostly in the local native dialect of Irish. The one exception, a child who was not yet attending childcare outside the home, was nevertheless being exposed to much local native Irish from his mother and from extended family living close by.

Table 15. Parental language status at time of recording.

Parental language status	Number of fathers	Number of mothers
Local Irish L1	23	32
Non-local Irish L1	0	2
Irish as fluent L2	11	3
Irish as non-fluent L2	2	2

As presented in Table 16, for twenty-eight children, both parents (or just their mother in the case of a single parent family) speak Irish more than 90% of the time to them. Seven others have two parents who both speak Irish to them most of the time (between 50 and 100%). The remaining four children have at least one parent who speaks mostly (between 50 and 100%) Irish to them.

Table 16. Self-reported everyday parental language use with their child at time of recording.

Parental Irish language use	Number of fathers	Number of mothers
90+ % Irish	28	31
50-89 % Irish	6	6
11-49 % Irish	1	0
0-10 % Irish	1	2

4.3.5 Selection and description of parent participants in sample.

The parents of all children invited to take part in the study were also invited to participate more directly in the study by being recorded producing a narrative themselves.

The narratives of twenty parents were recorded and included in the final sample for this study. The children of two of these parents were not included: one failed the repeat hearing screening e), the other did not return completed questionnaires. All of these twenty parents were native speakers of a local (south Connemara, County Galway) dialect of Irish. Six other parents were also recorded but not included in this study as they either had Irish as a second language or spoke another dialect of Irish. Such a high proportion of non-local and/or non-native speakers was considered likely to have been unrepresentative of the local norm. Ideally the parent sample should have been representative of the language backgrounds of adult speakers in the community however such detailed information was unavailable. It was decided to confine the parent group to those who had local native Irish in order to reflect the local norm. It is this local norm which is of primary focus in this study because we are interested in input for children of the wider community and not only the particular input of those children who participated in the study. All the children were exposed to this local norm: at home, in childcare and educational institutions and in the community in general. Table 17 presents the characteristics of parents included in the sample. One parent did not disclose her age and another didn't disclose her level of education. The mothers of three children did not refer to a father living with /spending time with their children.

Table 17. Number of parents included in each category of Age, Gender and Education.

	Age in years			Gender		Education	
	29-33	34-38	39-43	Female	Male	Low	High
Number of parents	3	8	8	19	1	6	13

4.4 Data collection: general overview

Data were collected using child and parent narrative elicitation and parent questionnaires.

Information needed:

Method:

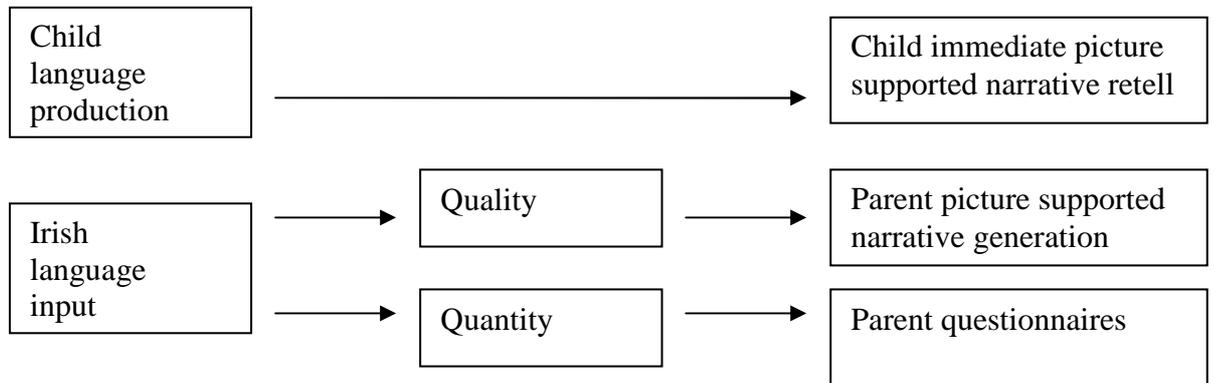


Figure 3 Overview of the methods of data collection in this study

4.4.1 Narratives: procedures and justification

Children’s narratives provided a window into child language production and parents’ narratives provided a window into the grammatical quality of the children’s Irish language input.

Procedures: child language production.

Familiarisation with the researcher.

The researcher first participated in informal classroom / preschool group activities in order to allow each child to become familiar with her. In the case of those children who were not yet attending such educational institutions, familiarisation was child lead, one-to-one and took place in their own homes. Individual data collection on child language production took place in a quiet room separate to the usual group room at the school or preschool. The school’s / preschool’s child protection policies were complied with. The child was introduced to the one-to-one situation and

became more familiar with the researcher during a casual parallel drawing activity. The researcher modeled the language of interaction, Irish, while also facilitating the child to lead conversation as much as possible.

Tasks and recording.

The child was then asked to listen to a story told by the researcher while looking at corresponding pictures in a 29 page picture book (*Frog, where are you?* Mayer, 1969) and advised that (s)he would then get a chance to tell the story her/himself. The child was given the following instructions:

Seo leabhar lán le pictiúirí. Insíonn sé scéal deas faoi bhuachaill agus a mhada agus frog. Ar dtús ba mhaith liom go n-éistfidh tú leis an scéal agus muid ag breathnú ar na pictiúirí. Ansin imeoimid ar ais go tús an leabhair agus beidh seans agat féin an scéal a inseacht domsa! Éist ar dtús!

(‘This is a book full of pictures. It tells a nice story of a boy, his dog and a frog. First I want you to listen to the story while we’re looking at the pictures. Then we’ll go back to the start of the book and it’ll be your turn to tell me the story! First listen!’)

When the researcher had told the story, she showed the child the picture she herself liked best and encouraged him/her to do the same. This was done in order to put the child further at their ease and to encourage talking following a long period of listening for the child. The researcher then returned to the beginning of the book and asked the child to tell the story in his or her own words while looking at the pictures again. Narrative retell rather than generation was used as the age group included children who were quite young and would as a result be unlikely to produce an extended monologue without a model. The researcher encouraged the child to continue telling the story by showing interest through facial expression and when necessary by giving neutral comments such as *mmhmm?*, *agus ansin..?* (‘and then?’) and occasionally repeating the final few words of the child’s sentences. This procedure was repeated for the sequel to this story (Story 2) which was

illustrated in a 15 page original picture book. This second story provided the children with further opportunity for producing particular grammatical structures which were not adequately represented in Story 1. Scripts and pictures for both stories are provided in Appendix 4.

The child's narration of each story was audio-recorded on a small dictaphone (*Zoom HI*) which was capable of producing high quality recordings and which was phone-like in appearance and placed unobtrusively on the table before the child entered the room.

Procedures: parent language production.

Tasks and recording.

Approximately a month later, in the child's educational or childcare setting, each parent participant was given a few minutes to look through the first picture book (Story 1) and then asked to tell the story to their own child(ren). Parents were told that the researcher was interested in the natural way parents communicated with their children and so asked to tell the story to their child(ren) as if they were at home and there was no recording equipment. Further, parents were advised that their children might like to ask questions, make comments and participate in other ways in the storytelling and that this was ok. The parents were asked to begin their story with the words *uair amháin bhí* (once ... was..) or simply *bhí* (was..) in order to prompt a story told in the past tense as this is what their children had produced. Finally, the researcher left the room during recording in order to facilitate an optimally natural interaction between parent and child.

Justification: why narrative?

The method of elicitation is an important consideration when obtaining samples for language analysis as it can have a significant influence on the kind of language produced (Wagner et al., 2000; Gazella & Stockman, 2003; Fiestas & Peña, 2004; Hesketh, 2004). Most often used are the direct

elicitation of particular structures and continuous language samples such as free conversation and narrative.

Although direct elicitation procedures are widely used in clinical contexts with this age group⁵, narrative was chosen partly because it has greater ecological validity than such more formal testing. Narrative is considered to have particular merit in assessing minority language production as it provides a more holistic view of language skills than more formal elicitation tasks (Stockman, 1996). Both children and parents in this community are exposed to various social rules and expectations with regard to language use in different contexts. As a result, more formal assessment procedures were predicted to elicit language which was particularly unreflective of everyday usage (to a greater extent than predicted with majority language monolingual participants). The quasi-natural task of narrative production for an interested audience provided both children and parents with a communicative impetus which served to distract from the unfamiliar aspects of the testing situation and better facilitate the production of natural everyday language.

Further, the use of a continuous language sample task rather than direct elicitation in data collection enabled a broad overview of multiple language domains. It allowed the avoidance of premature focus on a particular language domain or, for example, particular grammatical structures. As noted in previous chapters, relatively little is known about the grammatical quality of the language of the parent group and less about child Irish language development in general, especially in this age group. This relatively thin foundation necessitated casting the net of investigation widely in order to ensure, as far as possible, that significant details, informative with regard to child Irish language development, were not overlooked.

⁵ Structured formal assessments are widely used in clinical practice and in research with children as young as two or three year of age, for example, the *Reynell Developmental Language Scales* series of assessments (Edwards, Fletcher, Garman, Hughes, Letts and Sinka, 1997) and the *Clinical Evaluation of Language Fundamentals (CELF) Preschool* series of assessments (Wiig, Secord and Semel, 2004).

Free conversation also shares the characteristics mentioned above, which, for this study, make narratives preferable to more structured formal assessment: they are both quite natural tasks and they both provide continuous language contexts. Although free conversation is a more frequent and therefore, potentially, a more natural communication context for children and adults, narrative elicitation was employed in this study in order to simultaneously provide support and challenge.

Narrative can be a relatively supportive and, at the same time, challenging context for language production. The use of a picture book for support in narrative elicitation, as in this study, is a method which has been effectively employed by many researchers (Berman & Slobin, 1994; Norbury & Bishop, 2003; Reilly, Losh, Bellugi & Wulfeck, 2004). The oral story-model provided further such support for child participants. Using such supportive methods of narrative elicitation ensured a more standardised context across participants and thereby allowed useful comparison across those participants and facilitated accurate transcription (Heilmann, Miller, Iglesias, Fabiano-Smith & Nockerts, 2008). As suggested by studies of Irish language development (e.g. Hickey, 1987; Bennett-Kastor, 1999; O'Toole, 2009) and shown clearly by studies of development in other languages, between three and six years of age, children are developing complex grammatical structures. The challenging and yet motivating context of narrative and the various supports provided in this study are particularly useful for eliciting such language in a short space of time (Hadley, 1998; Paul, 2007). Using retell and picture support elements in narrative tasks have also been found to facilitate a longer sample from both TD and LI children (Merritt & Liles, 1989; Shapiro & Hudson, 1991). The target sample length was one which would allow multiple contexts for language measures across domains. This target sample length was achieved, at least for the children as a group.

Limitation of the narrative retell method

Unavoidably, the oral story model was unreflective of some children's home language exposure. For example, sometimes the story model was more reflective of the language of the preschool / school in its lack of language mixing. A deliberate choice was made to use Irish words and structures even when, for some children their English equivalents may have been more frequent in the input. This was done in order to encourage Irish words and structures from the children if they were in their repertoire.

4.4.2 Questionnaires: procedures, description and justification

Parent questionnaires were designed to provide a window into the quantity of input in each of the children's languages both currently and in the past.

Procedure.

Parents were given questionnaires to complete and return to the researcher at a later date. They had the opportunity to ask questions throughout their time with the questionnaires.

Description of Questionnaires.

Parents were asked to fill out two detailed diary-like questionnaires on their child's exposure to Irish and English, both past and present. The questionnaires were used to gather information on the proportion of Irish in children's language input from birth to present. These questionnaires sought similar information as the section entitled 'Linguistic Profile of the Home' in the questionnaire used in Gutiérrez-Clellan & Kreiter's (2003) study of child bilingual acquisition. Parents were asked for information on their child's typical weekday and weekend conversation partners from birth to present and the language use of these partners with the child during different periods of the child's life. Asking parents for such detailed information on the child's language exposure in the past as well as present was an important departure from Gutiérrez-Clellan and Kreiter's questionnaire. The major part of the questionnaires on language input were laid out in the following

manner (which was similar to that used by Place & Hoff , 2011): tables with parent-chosen time-frames during the day (e.g. 7am-8am, 2pm-5pm etc.) in the first column. The next four columns were designed for parents to write their child's conversation partners (granny, mom etc) and information regarding them (age, relationship to child, speaker status and percentage Irish and English spoken by them to the child). The questionnaires used in this study are provided in Appendix 2.

Justification of questionnaires.

Questionnaires have been used in many studies to gain information on language history and use from linguistically and culturally diverse families (Adler, 1991; Valdés & Figueroa, 1994; Siren, 1995; Pearson et al.,1997; Mikes, 2001; Gutiérrez-Clellan & Kreiter 2003; Gathercole & Thomas, 2005; Guiberson, Barrett, Jancosek & Yoshinaga-Itano, 2006; Gutiérrez-Clellan et al., 2006; de Houwer, 2007).

Employing parent report rather than direct observation in this study enabled the gathering of data which would not otherwise have been available: past language use of the child's conversation partners and these conversation partners' language status both past and present.

Further, in a study of language transmission in bilingual families in Wales, parents were found to be reliable reporters of their language usage with their children (Deuchar, 2007). Parents' reports can be considered reliable sources of language use because they have observed the children in a variety of communicative contexts over long periods of time (Thordardottir & Weismer, 1996).

Gutiérrez-Clellan & Kreiter (2003) used their questionnaire to structure a face-to-face interview whereas, in this study, parents were asked to complete questionnaires themselves over a period of a week or two. Questionnaires were chosen over interviews because detailed information was needed on the child's language input in the past as well as the present.

This necessitated allowing respondents time for thought and review, to consider language input in the present and also to think back to periods in the child's life up to six years earlier. The inherent time-pressure of an interview context may have discouraged such review.

Limitations of Questionnaires

There are limitations to this method of gathering information on language input. Firstly, it can be difficult for parents to estimate the amount of time children spend with different people and what proportion of each language these conversation partners speak particularly when reporting on typical weeks a few years in the past. Secondly, self report measures such as the questionnaires used in this study depend on participants being honest which is not always a reliable assumption. Parents may overestimate (probably subconsciously) the proportion Irish they speak to their children in an effort to align with their image of themselves or with the profile they feel the researchers want to see.

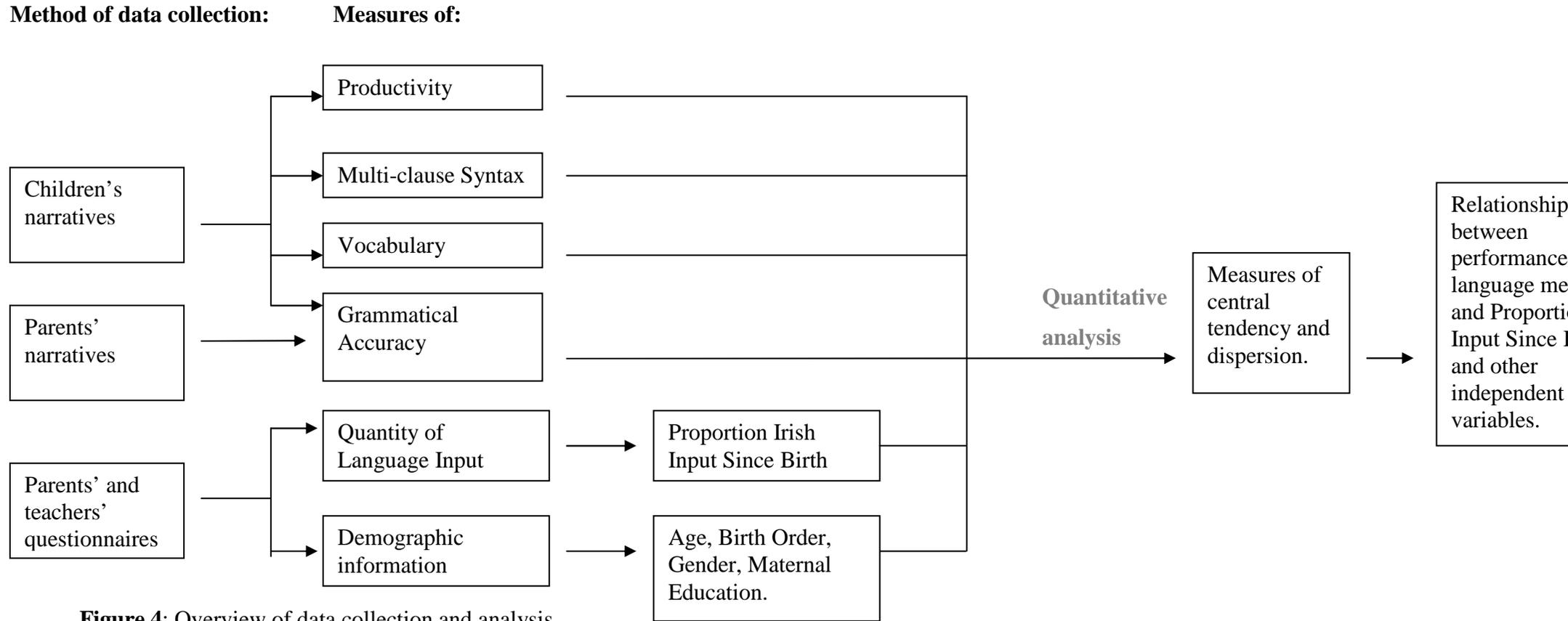


Figure 4: Overview of data collection and analysis.

4.5 Data Analysis

Figure 4 presents an overview of data collection and analysis in this study.

4.5.1 Narratives: transcription, coding and preliminary analysis.

Transcription of narratives.

A total of ninety-eight recorded stories were orthographically transcribed, with seventy-eight from thirty-nine children and twenty from twenty parents. Details of utterance segmentation and other transcription conventions used in this study are provided in Appendix 5.

Reliability of transcription was established by having a second transcriber check twenty-eight stories (29% of all transcriptions) for transcription accuracy. This included six parents' stories (30% of parent transcriptions) and twenty-four children's stories (31% of child transcriptions). Just over half of these were randomly chosen for checking to be carried out by an independent second transcriber. The remainder was checked by the researcher after having been transcribed by an independent transcriber. Each reliability estimate was calculated in terms of percentage agreement using the formula:

$$100 - ((\text{Number of disagreements}^6 / \text{total target words}^7) \times 100) = \text{percentage agreement.}$$

As expected, transcriptions of children's stories were, on average, slightly less accurate (Mean = 97.40; SD = 1.77; Range= 93.33 – 100 %) than those

⁶ Disagreements include word and morpheme repetitions, insertions, substitutions and omissions. Disagreements do not include differences in spelling conventions and pronunciations of sounds in words which have no influence on grammar e.g. *ulcabhán / ulchabhán / uclabhán*.

⁷ Total words comprise words spoken by the target speaker alone i.e. the child in child recordings and the parent in parent recordings.

of parents' stories (Mean = 98.13; SD = 1.33; Range : 95.83 – 99.41 %). Nevertheless, inter-transcriber reliability exceeded 93% in every case (mean = 97.6%; SD = 1.69; Range: 93.33 -100%) reflecting accurate transcription. Once reliability was established and discrepancies were resolved the transcripts were subjected to linguistic analysis.

Preliminary analysis of narratives.

Narratives are most commonly used for investigation of narrative skills (Liles, 1993) such as macrostructure and also cohesion and coherence in the microstructure. For clinical purposes, narratives can also be used as windows into performance with regard to many different aspects of language use such as fluency, pragmatics, semantics, phonology, grammatical accuracy, syntactic complexity and productivity. In this study, narratives are analysed across four language domains which are known to be sensitive to age and language ability in English and other languages and/ or in Irish and are therefore considered to be among useful language domains to assess language production: Productivity, Vocabulary, Multi-clause Syntax and Grammatical Accuracy. All four have been found to develop with age and language ability in English (Loban, 1976; Shapiro & Hudson, 1991; Rice & Bode, 1993; Scott & Windsor 2000; Durán, Malvern, Richards & Chipere, 2004; Westerveld, Gillon & Miller, 2004, Westerveld & Moran, 2011) and in Irish (Hickey 1987; 1990c; 1991; 1992; Ó Baoill, 1992; Bennet-Kastor, 1999; O'Toole, 2009). Grammatical accuracy has also been found to be a problem space in other languages, which, like Irish, are relatively richly inflected, such as French (Hamann, 2004), German (Rice, Noll & Grimm, 1997) and Turkish (Rothweiler et al., 2010). Again, all four have been found to distinguish between typically developing (TD) and language impaired (LI) children in English (Leonard, 1998; see Scott & Windsor 2000 for a review).

Multiple measures of each language domain allow detailed description and analysis of language and strengthen conclusions drawn with regard to domains of language and any relationship between these language domains

and independent variables. Many measures are exactly, or in the vein of, those used in the literature on other languages (mainly English). Others are new. Explanations of, and relevant references for, language measures are provided in Tables 18, 19 and 20.

Excluded from all language measures are habitual phrase starters, (e.g. *agus ansin* / 'and then'), false starts or subsequently repaired or simply abandoned words, phrases and utterances and direct conversation between the child and the researcher including closed-ended questions and replies to such questions.

Listed and explained in Table 18 (below) are multiple measures of three language domains: Productivity, Multi-clause Syntax and Vocabulary. Each child's Story 1 was examined for these measures. Some measures are expressed relative to a story length measure or as a proportion of a more general measure in order to control for varying length of narratives across participants (Reilly et al., 2004; Nippold et al., 2005).

Mean Length of Utterance (MLU) and Mean Length of T-Unit (MLTU) are generally considered to be measures of productivity which are also indicative of multi-clause syntax. In this study, these measures are categorised not as productivity measures but as measures of multi-clause syntax. One reason for this is that on reading the children's transcribed narratives, it was noted that they included few adjectives and adverbs. Adjectives, adverbs and multi-clause syntax are the primary reasons for longer utterances and t-units. The dearth of adverbs and adjectives used in the narratives collected from the children means that relatively high MLU and MLTU counts are particularly indicative of multi-clause syntax. Further, children can in theory produce lengthy stories comprised of mostly simple one clause sentences and therefore low MLU and MLTU counts does not necessarily mean low overall productivity. For these reasons, it was considered appropriate to categorise these language measures in the language domain Multi-clause Syntax rather than Productivity.

Chapter 4 Methodology

All language production measures included in this study are, to an extent, functions of the elicitation task. This is particularly true in the case of Verb Vocabulary. It is important to keep this in mind when generalising conclusions to other contexts.

Chapter 4 Methodology

Table 18:
Language measures: labels and definitions.

<i>Language Measure</i> (abbreviation if used; example reference)	<i>Definition</i>
<i>Productivity</i>	
Number of Words in T-Units (Liles <i>et al.</i> , 1995; Boudreau & Hedberg, 1999; Scott & Windsor, 2000; Botting, 2002; Westerveld <i>et al.</i> , 2004)	A count of all Irish, English and mixed language words in t-units. A t-unit is defined as one independent clause plus any number of subordinate clauses that are attached to or embedded in it (Hunt, 1965). Each clause of a coordinate sentence is considered one t-unit unless a co-referential subject deletion occurs in the second clause. Exclamations such as <i>splais!</i> / 'splash!' are not considered t-units.
Number of Words in Propositions (Liles <i>et al.</i> , 1995; Boudreau & Hedberg, 1999; Botting, 2002; Westerveld <i>et al.</i> , 2004)	A count of all Irish, English and mixed language words in propositions. A proposition comprises a verb and its arguments (including qualifying adjectives and prepositional phrases) and corresponds to one event (Reilly <i>et al.</i> , 2004). This definition of a proposition is modified to be more appropriate for description of the Irish language and therefore to more faithfully reflect the competence of its young speakers. Those units which, instead of verbs, have words which fulfill the function of verbs were included as propositions. For example: P6: Sin an frog : 'That's the frog', where sin, although not a verb, translates to English as 'that is'. More examples of propositions are provided in Appendix 6.
Number of Words in Utterances (Liles <i>et al.</i> , 1995; Boudreau & Hedberg, 1999; Botting, 2002; Westerveld <i>et al.</i> , 2004)	A count of all Irish, English and mixed language words in utterances. Utterance boundaries are determined by grammar, pausing and intonation. Utterances can be non-clausal elements such as short exclamations or labelling and can be as long as a multi-clause sentence.
Number of T-Units (Scott & Windsor, 2000; Fey <i>et al.</i> , 2004; Nippold <i>et al.</i> , 2005, 2007)	A count of Irish and mixed language t-units.
Number of Propositions (Shapiro & Hudson, 1991; Stiles <i>et al.</i> , 1998; Bennett-Kastor, 1999; Reilly <i>et al.</i> , 2004)	A count of Irish and mixed language propositions.
Number of Utterances (Liles <i>et al.</i> , 1995; Fey <i>et al.</i> , 2004)	A count of Irish and mixed language utterances.
Mean Length of Propositions in Words (MLP in Words; New)	A division of the total number of words in all propositions by the number of propositions. Words which were not in propositions are not counted.
<i>Multi-clause Syntax</i>	
Mean Length of T-Unit in Words (MLTUw; Hunt, 1970; Gutiérrez-Clellan, 1998; Scott & Windsor, 2000; Nippold <i>et al.</i> , 2005, 2007)	A division of the total number of words in all t-units by the number of t-units. Words which were not in t-units are not counted.
Mean Length of Utterance in Words (MLUw; Miller, 1981; Hickey, 1987, 1991; Westerveld <i>et al.</i> , 2004; Nippold, 2007; Muckley & Antonijevic, 2009)	A division of the total number of words in all utterances by the number of utterances. Using this measure rather than MLU in morphemes enables a more reliable calculation and also better facilitates comparison across more and less richly inflected languages like Irish English in future studies.
Total Instances of Multi-clause Syntax (New)	A count of the instances of coordinate syntax and complex syntax.
Proportion of Multi-clause Syntax which is Coordinate (New)	A division of the instances of coordinate syntax by the number of instances of multi-clause syntax. This measure takes varying story length across children into account.
Ratio of Total Instances of Multi-clause Syntax to Propositions (New)	A division of the number of instances of multi-clause syntax by the number of propositions. Each instance of coordinate or complex syntax is counted as one instance of multi-clause syntax. This measure takes varying story length across children into account.
Number of Instances of Coordinate Syntax (New)	A count of the instances of coordinate syntax.
Ratio of Coordinate Syntax to Propositions (New)	A division of the number of instances of coordinate syntax by the number of propositions. This measure takes varying story length across children into account.

Chapter 4 Methodology

Table 18 continued:
Language measures: labels and definitions.

Number of Instances of Complex Syntax (New)	A count of the instances of complex syntax.
Ratio of Instances of Complex Syntax to Propositions (Shapiro & Hudson, 1991)	A division of the number of instances of complex syntax by the number of propositions. Each subordinate and embedded clause is counted as one instance of complex syntax. This measure takes varying story length across children into account.
Ratio of Instances of Complex Syntax to Utterances (Scott, 1988; Scott & Stokes, 1995; Gutiérrez-Clellan, 1998; Fey <i>et al.</i> , 2004; Nippold <i>et al.</i> , 2005)	A division of the number of instances of complex syntax by the number of utterances. Each subordinate and embedded clause is counted as one instance of complex syntax. This measure takes varying story length across children into account.
Diversity of Complex Syntax Types (Diversity of CS; Stiles <i>et al.</i> , 1998; Reilly <i>et al.</i> , 2004)	A count of the number of different types of complex syntax used.
<i>Verb Vocabulary</i>	
Number of Verb Types (Rice, 1993)	A count of the number of Irish, English and mixed language verb types. All regular forms of a verb are considered a single type. All irregular forms are considered separate types.
Ratio of Verb Types to Propositions (New)	A division of the total number of verb types by the number of propositions. This measure is designed to take varying story length across children into account.

Listed and explained in Table 19 and 20 are multiple Grammatical Accuracy measures. In the case of the Grammatical Accuracy language domain, it was necessary to record, transcribe and analyse two stories from each child (modelled by Story 1 and Story 2) because there were, at times, insufficient obligatory contexts for these grammatical structures in Story 1 alone. Grammatical accuracy was judged, on a structure by structure basis, in comparison with available descriptions of traditional South Connemara Irish (De Bhaldraithe, 1977; Ó Curnáin, 2007) and generally expressed in terms of the proportion structures correct. Because the language of those born from about 1960 onwards has been reported to differ significantly from traditional Irish (e.g. Ó Curnáin, 2007), grammatical accuracy measures coded for and analysed in children's transcriptions were also coded for and analysed in parents' transcriptions to get a picture of the language of the parent group i.e. the children's model and target. Those measures for which performance was found to be consistent across parents in data analysis in this study, are set out in Table 19. For some measures, parents were found to vary in their performance both inter and intra-individually. These are referred to as inconsistent measures and are set out in Table 20. Inconsistent input meant that the patterns by which children acquire language were no longer available for those particular grammatical structures and therefore children acquired mostly the simplest forms in the input, at least during the age period studied here. As a result, further analysis of children's

Chapter 4 Methodology

grammatical accuracy and its relationship with independent variables focused primarily on those grammatical accuracy measures which were consistent across parents (those laid out in Table 19).

Further details on language measures outlined in the below tables are provided in Appendix 6.

Chapter 4 Methodology

Table 19:
Grammatical accuracy measures for which parents were consistent: labels and definitions.

<i>Grammatical Accuracy Measure</i> (Hickey, 1987; 1990c; 1992; Ó Baoill, 1992; Owens, 1992; O'Toole, 2009)	Definition
<i>Verb morphology</i>	
Past Tense Lenition	The proportion of obligatory contexts in which lenition marks a verb for past tense. Example: Stem (<i>bris</i> : 'to break') marked with lenition for past tense: <i>b h ris</i> ; * <i>bris</i> . Obligatory contexts neither include English nor mixed language verbs.
Past Tense Proclitic <i>d'</i>	The proportion of obligatory contexts in which proclitic <i>d'</i> (+ lenition) marks a verb for past tense. Marking for past tense in regular verbs beginning with 'f' consists of lenition and prefixing of <i>d'</i> . In regular verbs beginning with a vowel <i>d'</i> is prefixed in the past tense. Examples: Stem (<i>fág</i> : 'to leave') marked with lenition and proclitic <i>d'</i> for past tense: <i>d' f h ág</i> ; * <i>fág</i> ; Stem (<i>ith</i> : 'to eat') marked with proclitic <i>d'</i> for past tense: <i>d' ith</i> ; * <i>ith</i> . Obligatory contexts include neither English nor mixed language verbs.
Past Tense Lenition of <i>bí</i>	The proportion of obligatory contexts in which lenition marks the verb <i>bí</i> for past tense. Example: Stem (<i>bí</i> : 'to be') marked with lenition for past tense: ' <i>b h í</i> ' ; * <i>bí</i> ' .
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser <i>a</i>	The proportion of obligatory contexts in which lenition marks a verbal noun or direct relative verb following the preverbal particle <i>a</i> . Example: <i>a</i> + Verbal Noun lenition: <i>bhí sé ag triáil an mada a fháil</i> : 'he was trying to get the dog'; <i>a</i> + direct relative: <i>an torann a dhéanann frog</i> : 'the noise that a frog makes'.
Eclipsis of Verbs following the Complementiser <i>go</i>	The proportion of obligatory contexts in which eclipsis marks a verb following the preverbal complementiser particle <i>go</i> . Example: <i>b'fhéidir go m beadh sé</i> : 'maybe he would be'.
Future Tense of Verbs	The proportion of obligatory contexts in which the future tense of a verb is produced accurately. Example: Stem of regular verb (<i>tóg</i> : 'to take') with future tense morpheme appended: <i>tóg faidh</i> ; Irregular verb (<i>tar</i> : 'to come') in future tense: <i>tiocfaidh</i> .
Dependent Form of <i>bí</i> : <i>raibh</i> / <i>bhfuil</i> following Particles	The proportion of obligatory contexts in which a dependent form of verb <i>bí</i> (to be) follows particles. Example: <i>ní raibh sé</i> : 'he was not'; <i>cá bhfuil</i> : 'where'; * <i>ní bhí sé</i> : 'he was not'.
Irregular Verbs following Negative Particles	The proportion of obligatory contexts in which the accurate form of the irregular verb (in the dependent form and/or with initial mutation) follows a presentential negative marker: <i>ní b h eadh sí</i> : 'she will not be'; <i>ní fhaca sé</i> : 'he didn't see'; * <i>ní chonaic sé</i> : 'he didn't see'. * <i>ní bhfaca sé</i> : 'he didn't see'.
<i>Noun morphology</i>	
Masculine Possessive Pronoun Lenition of Nouns	The proportion of obligatory contexts in which lenition marks a noun following the masculine possessive pronoun 'a'. Example: (<i>buataisí</i> : 'boots') <i>a b h uataisí</i> : 'his boots'.
Plural Nouns	The proportion of obligatory contexts in which plural nouns are produced accurately. Examples: <i>crann</i> : 'tree', plural: <i>crainnte</i> ; <i>capall</i> : 'horse', plural: <i>capla</i> ; <i>beach</i> : 'bee', plural: <i>beacha</i> ; <i>cat</i> : 'cat', plural: <i>cait</i> .
Inappropriate Lenition of Nouns	A count of the number of times nouns are lenited inappropriately.
Inappropriate Eclipsis of Nouns	A count of the number of times nouns are eclipsed inappropriately.
<i>Prepositions</i>	
Simple Prepositions	The proportion of obligatory contexts in which simple prepositions are produced accurately. Examples: <i>í</i> : in ; <i>faoi</i> : under ; <i>ar</i> : on.
<i>San</i> preceding Nouns beginning with Vowels	The proportion of obligatory contexts in which the combined simple preposition and article <i>san</i> precedes a noun beginning with a vowel. Example: <i>san uisce</i> : 'in the water'.
<i>San</i> preceding Nouns beginning with Consonants	The proportion of obligatory contexts in which the combined simple preposition and article <i>san</i> precedes a noun beginning with a consonant. Examples: <i>san poll</i> : 'in the hole' ; <i>san crúscá</i> : 'in the jug'. Although uncommon, this is a possible dialect feature and is therefore investigated in this study.

Chapter 4 Methodology

Table 19 continued:

Grammatical accuracy measures for which parents were consistent: labels and definitions.

<i>Multi-clause syntax</i>	
Simple Verbal Noun Complement Clauses	The proportion of obligatory contexts in which simple verbal noun complements are produced accurately. A simple verbal noun complement is one in which the verbal noun is intransitive and which therefore observes the typical Verb-Object word order. Example: <i>thosaigh siad a(g) cuartú</i> : 'They started searching'; * <i>caithfidh sé b'í mar seo</i> : 'it has to be like this.'
Special Word Order in Complex Verbal Noun Complement Clauses	The proportion of obligatory contexts in which the direct object precedes a transitive verbal noun in a verbal complement clause. Examples: <i>d'théadfaimid iad a vísitéáil</i> : 'we could visit them '; * <i>ní raibh siad in ann fáil é</i> : they weren't able to get him .
Direct Relative Clauses	The proportion of obligatory contexts in which head verbs in direct relative clauses are produced accurately. Example: <i>frog a bhí ann</i> : 'it was a frog that was there'; * <i>cé a raibh ann</i> : 'who was there'. Some speakers produce 's' at the end of a direct relative verb e.g. <i>céard a thuganns</i> . Presence or absence of this 's' was not considered in judging accuracy in this study.
Propositional and Adjectival Complement Clauses	The proportion of obligatory contexts in which propositional and adjectival complements are accurate. A propositional complement modifies a perception, cognition or utterance verb. Example: <i>he thought go raibh sé</i> = 'he thought that he was '; * <i>ní raibh fhios aige bhí sé ann</i> : 'he didn't know he was there'; An adjectival complement modifies an adjective. Example: <i>bhí sé oibrithe nach raibh sé</i> : 'he was angry that he wasn't '; * <i>bhí sé so happy ní raibh sé ...</i> : 'he was so happy he wasn't '....
Adverbial Clauses	The proportion of obligatory contexts in which adverbial clauses are produced accurately. An adverbial clause modifies a whole clause <i>Mar / mar gheall</i> followed by 'independent verb / go+ dependent verb' accepted because both are common in the parent group. Similarly conjunctions in English are acceptable if the grammatical structure is common in the parent group. Examples: <i>Nuair a bhíteáil sé</i> : 'when he bit'; <i>mar gheall tá sé</i> : 'because he is'; *(omission) <i>gur cheap sé</i> : '(because) he thought'; <i>because nach raibh sé ann</i> : because he wasn't there.
Direct Speech Constructions	The proportion of obligatory contexts in which direct speech constructions are produced accurately. Example: <i>bhí sé "cáil tú?"</i> : 'he was "where are you?"'; <i>dúirt sé "slán!"</i> : 'he said "bye!"'.
Pseudo-cleft Constructions	The proportion of obligatory contexts in which pseudo-cleft constructions are produced accurately. Example: <i>céard a bhí ann ach ...</i> : 'what was there but..'; * <i>bhí sé ann ach frogannaí</i> : *'he was there but'
<i>Other</i>	
Preverbal Particles	The proportion of negative, question and comparative preverbal particles which are accurate. Examples: <i>níor aithnigh sé</i> : 'he didn't recognise'; <i>céard tá</i> : what is; <i>gur leag sé</i> : 'that he knocked'; * <i>ní léim sé</i> : he didn't jump.
Adjective Agreement with Plural Nouns	The proportion of obligatory contexts in which the adjective agrees in number with the plural noun. Example: <i>frogannaí beaga</i> : 'small frogs', <i>póigíní móra</i> : 'big kisses'.
ag preceding Verbal Nouns	The proportion of expected contexts in which the verbal noun is preceded by the preposition <i>a(g)</i> . Examples: <i>tá an gadhar a(g) tafann</i> : the dog is barking; <i>tá sé a(g) cuartú</i> : 'he is searching'.
Article Agreement with Plural Nominative Case Nouns	The proportion of obligatory contexts in which the article agrees with a plural nominative case noun. Example: (singular : <i>an beach</i> : 'the bee'), plural: <i>na beacha</i> : 'the bees'.

Notes: 1. When 'No O.C.s (obligatory contexts) = zero accuracy' is appended to a Grammatical Accuracy measure label it differs from the regular version of this language measure in that when no obligatory contexts for the language measure exist in a child's story he or she is considered to have zero accuracy for that language measure. In the case of the regular language measures (i.e. those which don't have this appendix) when there are no obligatory contexts in a child's story, that child's performance on that language measure is considered to be unknown and therefore excluded from analysis.

2. Some Grammatical Accuracy measures, although relatively consistent for parents, were not statistically analysed for children because there were not enough obligatory contexts in children's stories. One example of this is the measure: 'indirect relatives (not áit)'. In children's stories these mostly appeared as *cá bhfuil* ('where'). These were all correct however were probably learnt as formulae similar to single words in themselves and therefore not reflective of grammatical accuracy. 3. Hickey, Ó Baoill, Owens and O'Toole focus on the emergence of grammatical structures outlined here rather than the proportion of time in which they are accurate.

Table 20:

Grammatical accuracy measures for which parents were inconsistent: labels and definitions.

<i>Grammatical Accuracy Measure</i> (Hickey 1987; 1990c; 1992; Ó Baoill, 1992; O'Toole, 2009)	Definition
Indirect relative dependent form of verb following <i>áit</i> .	The proportion of obligatory contexts in which the indirect relative dependent form of the verb follows the word <i>áit</i> . Example: <i>áit a raibh na beacha</i> : 'the place that the bees were'; * <i>áit a bhí na beacha</i> : 'the place that the bees were'.
Prepositional case inflection directly following a preposition (plus 5 subcategories and variations)	The proportion of obligatory contexts in which nouns are inflected for prepositional case directly following a preposition.
Prepositional case inflection following an article (11 subcategories and variations plus 1 subtype which includes both inflection of borrowed words directly following a preposition and following an article)	The proportion of obligatory contexts in which nouns are inflected for prepositional case following an article.
Gender marking of nouns in the nominative case following an article	The proportion of obligatory contexts in which nouns in the nominative case are marked for gender following articles. Examples: <i>ulchabhán</i> (masculine): 'owl', <i>an t-ulchabhán</i> : 'the owl' ; <i>fuinneog</i> (feminine): 'window', <i>an fhuinneog</i> : 'the window'.
Genitive case inflection of nouns (6 subcategories)	The proportion of obligatory contexts in which nouns are inflected for genitive case.

Note: Hickey, Ó Baoill, Owens and O'Toole focus on the emergence of grammatical structures outlined here rather than the proportion of time in which they are accurate.

4.5.2 Questionnaires: preliminary analysis

In this study, questionnaires were used to gather information on the proportion of Irish in children's language input from birth to present. Two questionnaires contributed to this single goal. Parents were asked to complete questionnaires on language input in different periods of the child's life in the past and also on current input.

Information on current Irish input alone rather than Irish input since birth would have been less time consuming both for parents to provide and for the researcher to calculate. However, bilingual children can differ greatly as to the age of onset of each language as well as in terms of the proportion of input in each of their two languages over their lives. A meaningful age of onset can be very difficult if not impossible to pinpoint as Irish speaking children are often exposed to both languages since birth, the input in one

language (either English or Irish) increasing gradually as the child interacts with more and more people or as the patterns of parent language use change. In many bilingual situations current language input may be very different from language input 6 months before and 2 years before. In this study, a comparison of the current and ‘since birth’ language input measures, presented in Appendix 7, shows a substantial difference in the two scores for many children (Mean change: .10897; SD: .124508; Range: .479) indicating a change in the proportion of language input which was in Irish over time. A measure similar to a measure used by Unsworth, Argyri, Cornips, Hulk, Sorace and Tsimpli (2011) Proportion Irish Input Since Birth addresses the confound between quantity of input and age of onset in this study.

The number of hours exposure to Irish since birth was calculated and expressed as a proportion of the total number of waking hours since birth to return the measure: Proportion Irish Input Since Birth. Occasionally parents did not indicate waking hours for particular periods, for example, the sentence “they were with me all day” sometimes took the place of particular times of going to bed and rising. Unsurprisingly, this occurred almost uniquely when these parents were describing the child’s typical days between 0 and 12 months. The child, in this case, was assigned the average number of waking hours across all children whose parents did report this information for that age period. In the calculation of the contributions to the child’s language input of two or more conversation partners who were in the child’s company simultaneously, the time was divided equally between conversation partners (Gutiérrez-Clellan & Kreiter, 2003).

4.5.3 Statistical analysis: language production, input and demographic measures.

4.5.3.1 Introduction

Children’s performance on language production measures and their Proportion Irish Input Since Birth were first statistically analysed and

described independently resulting in a set of summary statistics. Further statistical analyses investigated relationships between language production measures and language input and the four other independent variables: Age, Gender, Birth Order and Maternal Education.

4.5.3.2 Summary statistics: measures of central tendency and dispersion.

Summary statistics including measures of central tendency (mean and standard deviation) and measures of dispersion (minimum and maximum) for language production measures and Proportion Irish Input Since Birth were calculated for all child participants and presented in Tables 23-25a in the Results chapter.

4.5.3.3 Correlation tests

Correlation tests were conducted to investigate for associations between language production measures and the following five independent variables: Age in months (Age), Proportion Irish Input Since Birth (Irish Input), Birth Order, Gender and Maternal Education. Two different correlation tests were used because of the differing levels of measurement and distribution of data in different variables (as presented in Table 21): the parametric Pearson's product moment correlation coefficient (r) and its non-parametric equivalent, the Spearman's rank correlation coefficient or Spearman's rho (P).

Table 21. The nature of dependent and independent variables.

Variable	Level of measurement	Distribution
Age	Continuous: Ratio	Normal
Input	Continuous: Ratio	Left skewed
Birth Order	Dichotomous: Ordinal	Right skewed

Gender	Dichotomous: Nominal	Right skewed
Maternal Education	Dichotomous: Ordinal	Left skewed
Productivity measures	Continuous: Ratio	5 out of 7 normal Right skewed: Number of T-Units, Number of Utterances.
Multi-clause Syntax measures	Continuous: Ratio	9 out of 12 normal; Three right skewed: Number of Instances of Coordinate Syntax, Ratio of Coordinate Syntax to Propositions, Diversity of Complex Syntax
Verb Type Vocabulary measures	Continuous: Ratio	Normal
Grammatical Accuracy measures	Continuous: Ratio	All non-normal: 22 left skewed; 8 right skewed and 14 high at both extremes.

Note: Distribution judgements are based on Shapiro-Wilk statistics and appearance of histograms.

The purpose of the Pearson's r correlation test is to investigate for and measure the strength of a linear relationship between two variables. The null hypothesis is that there is no linear relationship between the two variables. Pearson's r is usually considered to be applicable to variables which are both normally distributed and at the interval/ratio level of measurement. In fact Pearson's r can also be used when one of the pair of variables is dichotomous. In such cases, Pearson's r is used to estimate the Point-biserial correlation coefficient which is a special case of Pearson's and is mathematically equivalent to it (Howell, 2010; Urdan, 2005).

We cannot be sure whether data is normally distributed or not, especially with relatively small sample sizes (maximum sample size in the current study = 39). Decisions are based on graphical judgements and a normality test (the Shapiro-Wilk for small samples) which when positive only indicates that we cannot reject the null hypothesis of normality, not that the data is definitely normally distributed. For this reason, the use of both a parametric and a non-parametric test provided a broader lens through which to examine variables for relationships.

Further, parametric tests are more statistically powerful (or sensitive) than their nonparametric counterparts however they are also heavily influenced by outliers and non-normal distributions (statsoft.com). Pearson's r , despite being the most widely used of the correlation tests, is for this reason not always the most appropriate test. It has the aforementioned weaknesses of all parametric tests. Spearman's ρ is a non-parametric test which is calculated by applying the Pearson's correlation formula to the ranks of data rather than to the actual data values themselves and thereby avoids some of the weaknesses of Pearson's r . Spearman's ρ is useful in identifying nonlinear (but still monotonic) relationships as well as linear relationships. It is usually considered to be appropriate when data is at least ordinal however it can also be used with nominal level data if it is dichotomous (e.g. gender) as order is not relevant in this kind of nominal level data.

4.5.3.4 Distribution and trend tests

More tests were then conducted to further investigate the significant and near significant relationships found in correlation tests between language production measures and Age, Irish Input, Birth Order, Gender and Maternal Education. These tests were conducted to compare distributions of language production measures across groups based on these five independent variables. Distribution of language production measures were tested across three age groups i.e. 3 years (37-47 months), 4 years (48-59 months) and 5 and 6 years (60-76 months), across two age groups i.e. 3 and

4 years (37-59 months) and 5 and 6 years (60 - 76 months) and across a further two age groups i.e. 3 years (37-47 months) and 4, 5 and 6 years (48-76 months). Distribution of language production measures were also tested across two levels of each of the following independent variables: Proportion Irish Input Since Birth (low: <.70 and high: >.78), Birth Order (later born and first born), Gender (female and male) and Maternal Education (low: less than one year of third level education and high: at least one year of third level education).

Data were divided into groups or levels based on hypotheses that these groups or levels would behave differently from each other. The level of difficulty of choosing cut-off points between groups varied across independent variables. For example, it was very clear that in the case of Gender the natural groups are male and female. In the case of Birth Order, the literature indicates a difference between first born and later born children. With regard to Age, there is no evidence to indicate that a change takes place on a child's birthday but for the sake of following convention and ease of interpretation and reporting the above outlined age groups were chosen.

Maternal Education could sensibly have been divided into 3 or more groups, for example, did not complete secondary school; completed secondary school; completed a degree. However, based on the profile of the families who participated in this study, and using the literature as a guide, the above outlined grouping was considered most sensible. Dividing those who did not complete a third level qualification into subgroups of those who did and did not complete secondary school did not make sense because so few (4) mothers did not complete secondary school. Perhaps the results of dividing those who went on to third level education into two groups (those who held degrees and those who held postgraduate qualifications) would have been interesting. This was not done because no precedent could be found in the literature and also because it was predicted that the greater difference in language development based on socioeconomic status would be between children from low and high socioeconomic status families. It was predicted

that any difference between those children whose mothers were college graduates and those whose mothers held postgraduate qualifications would be less significant and therefore of less interest to this study.

Finally, in the case of Proportion Input in bilingual children, 50% is an obvious cut-off point. As we had invited children who mainly heard Irish to participate in this study, only three children had less than 50% Irish input. In any case, it was decided that, in the case of a minority language, this cut-off point should be higher in order to allow for the difficulty of measuring environmental majority language input. Such input may include more infrequent, short term or background input which would not be captured in questionnaires based on typical days and weeks and the child's main conversation partners. Language heard in the background from the broadcasting media, on holidays, in shops in the city or even from visitors would often be in the majority language. It was decided that children reported to have between 50% and 70% Irish input were more likely to slip below 50% if it was possible to measure input more accurately. These children may therefore have had English as their main input language and their Irish language developing accordingly. No child participant in this study had Proportion Irish Input between 70 and 78%. Those children with input above 78% were considered less likely to slip below 50% Irish input and therefore there was greater certainty that Irish was indeed their main input language. Therefore the language of children with Proportion Irish Input below 70% and the language of those with Proportion Irish Input above 78% were hypothesised to develop differently.

The non-parametric equivalent of the One Way ANOVA, the Kruskal Wallis test was chosen as many of the test variables (language production measures) violate the distribution and variance assumptions of the One Way ANOVA test. The Mann-Whitney U test is usually used when there are only two groups as in most of the cases here. However, as the Kruskal-Wallis is mathematically identical to it (being similar to a series of U tests) and also appropriate for more than two groups and ordinal and interval level data, the Kruskal-Wallis test was used across the board for the sake of simplicity and

without compromising accuracy. The null hypothesis of the Kruskal-Wallis test is that the samples come from populations such that the probability that a random observation from one group is greater than a random observation from another group is 0.5. It simply tells us whether a difference in distribution exists across groups. The Jonckheere-Terpstra trend test (*J*) (which has greater statistical power than the Kruskal-Wallis test) was then conducted in order to investigate for the presence and direction of a monotonic trend across groups. The null hypothesis is that no systematic trend exists across groups. Of course, in the case of a difference in significant distribution between only two groups there will always be a monotonic trend. The purpose of the Jonckheere trend test in these cases was simply to indicate the direction of that trend. In the case of three groups the Jonckheere trend test indicated both whether a monotonic trend was present and if so what the direction of that trend was.

4.5.3.5 Multiple regression analyses

Multiple regression analyses were conducted to investigate the role of each of the five independent (potential predictor) variables when the effect of the others were taken into account and also which measures within each language domain were best explained by this model. Dummy or binary variables: Gender, Birth Order and Maternal Education as detailed above, were included as predictor variables with the quantitative variables: Age and Input. The enter method was used for all multiple regression analyses. Using the enter method, all predictor variables are entered into the regression equation at once. This standard method was chosen over, for example, stepwise regression because we wanted to investigate the size of the overall relationship between predictor (independent) and predicted (dependent) variables and also how much each predictor variable contributes to the relationship. A stepwise regression would focus on finding out which combination of independent variables would best predict the dependent variable. In this kind of regression not all independent variables would be included in the final equation.

When a correlation was found between predictor variables (e.g. Maternal Education and Input: $r = .42$, $p = .009$; $P = .13$, $p = .459$; Maternal Education and Gender: $r = .35$, $p = .034$; $P = .35$, $p = .034$), Variance Inflation Factors (V.I.F.s) were calculated in order to ensure that multicollinearity was not present. V.I.F.s were found to be less than 2 which indicates no multicollinearity problem (Hocking, 2003) and therefore multiple regression analyses were considered to be appropriate.

Throughout the reporting of all results, attention is drawn not only to significant results ($p < .05$) but also to those which approach significance ($p = .050$ to $.099$). In small samples, an insignificant result may be falsely returned where in a larger sample the null would have been appropriately rejected (Moore, McCabe & Craig, 2012). Considering effects at this higher significance level is an attempt to avoid such Type II errors when sample size cannot be increased (Rubin, 2010).

4.5.3.6 Reporting language measures and independent variables: expected relationships.

As discussed in literature review chapters, language is expected to develop with Age and Input and also, in general, with Maternal Education. Advantages of girls and first born children in language development are also expected. In most cases this means a positive direction in relationships between these independent variables and language measures. However, in the case of Gender, girls are coded as 0 and boys as 1 and therefore an advantage for girls is indicated by a negative rather than a positive relationship. In addition, a decrease in the level of some individual language measures may, in fact, indicate language development. These are listed in Table 22 below.

Table 22. Rationale for the possibility that language development may be indicated by a decline rather than rise in particular language measures.

Language measures	Language	Rationale
-------------------	----------	-----------

	Domain	
Proportion of Multi-clause Syntax which is Coordinate	Multi-clause Syntax	Crosslinguistically, coordinate syntax is a relatively early developing Multi-clause syntax construction. As it develops, complex syntax often replaces coordinate syntax. For this reason, as complex syntax develops coordinate syntax may decrease. Therefore a decrease in coordinate syntax may be considered a sign of language development.
Number of Instances of Coordinate Syntax		
Ratio of Coordinate Syntax to Propositions		
Inappropriate Lenition of Nouns	Grammatical Accuracy	In contrast to all other Grammatical Accuracy measures, these measures describe errors rather than accuracy. Consequently, language development may be indicated by a decrease rather than increase in these measures.
Inappropriate Eclipsis of Nouns		
<i>San</i> preceding Nouns beginning with Consonants		

Chapter 5 Results

5.1 Introduction

Summary statistics for children's performance on language production measures and their Proportion Irish Input Since Birth will first be presented.

In order to find out whether there is a relationship between a set of independent variables that describe characteristics of children and their environment and multiple measures of language production, five complementary tests were conducted. These comprised parametric and non-parametric correlation tests, non-parametric distribution and trend tests and parametric multiple regression analyses each giving us a different and complementary insight into the relevant relationships. The set of independent variables will comprise: Age in months (Age), Proportion Irish Input Since Birth (Irish Input), Birth Order, Gender and Maternal Education. The domains of language production which will be assessed across children in the sample are: Productivity, Multi-clause Syntax, Verb Vocabulary and Grammatical Accuracy.

The most useful measures of each language domain, in terms of established statistical interdependencies, will be identified primarily by relatively high R square coefficients in multiple linear regression analyses and with supporting evidence from strength and frequency of significant relationships returned in correlation, distribution and trend tests.

5.2 Summary statistics

Summary statistics for all children's Proportion Irish Input Since Birth according to age group are presented in Table 23. Measures of central tendency (mean) and dispersion (standard deviation, minimum and maximum) provide a picture of the profile of Proportion Irish Input Since Birth of these child participants. The child participant group comprised 32 children with 'high' (>78%) Irish Input Since Birth and 7 children with 'low' (<70%) Irish Input Since Birth. There were three three year olds with low Proportion Irish Input Since Birth and two four year olds. There were also two children in the five and six year olds group who had 'low' Proportion Irish Input Since Birth.

Table 23. Summary statistics of children's Proportion Irish Input since birth by age group

<i>Age group</i>	Mean	SD	Minimum	Maximum
All	0.85	0.22	0.05	1
3 year olds	0.83	0.23	0.19	1
4 year olds	0.89	0.17	0.42	1
5 and 6 year olds	0.83	0.28	0.05	1

Summary statistics for all children's performance on Productivity, Multi-clause Syntax and Verb Vocabulary measures according to age group are presented in Table 24, below. Measures of central tendency (mean) and dispersion (standard deviation, minimum and maximum) provide a picture of each different age group's performance profile on these language measures.

Chapter 5 Results

Table 24. Summary statistics of children's performance by language measure (Productivity, Multi-clause Syntax and Vocabulary) per age group.

<i>Productivity measures</i>	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Number of Words in T-Units	219.23	80.65	104.00	417.00	249.50	55.76	139.00	344.00	318.25	60.27	220.00	395.00
Number of Words in Propositions	221.00	80.88	105.00	423.00	250.21	56.06	139.00	343.00	320.00	62.33	220.00	408.00
Number of Words in Utterances	233.00	78.64	114.00	421.00	258.21	59.43	142.00	351.00	327.92	66.74	221.00	404.00
Number of T-Units	43.15	13.79	29.00	83.00	45.14	11.55	29.00	75.00	51.33	9.17	37.00	66.00
Number of Propositions	47.23	14.95	32.00	88.00	51.43	13.44	31.00	86.00	60.00	11.51	40.00	80.00
Number of Utterances	42.39	13.28	30.00	79.00	41.14	12.35	23.00	71.00	42.33	6.20	31.00	55.00
MLP in Words	4.64	0.66	3.28	5.48	4.91	0.55	3.99	5.86	5.34	4.03	4.85	6.21

Chapter 5 Results

Table 24 continued. Summary statistics of children's performance by language measure (Productivity, Multi-clause Syntax and Vocabulary) per age group.

<i>Multi-clause Syntax measures</i>	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
MLTU in Words	5.04	0.79	3.47	6.18	5.60	0.81	4.48	7.28	6.21	0.57	5.33	7.32
MLU in Words	5.56	1.29	3.26	7.58	6.48	1.32	4.94	9.39	7.82	1.70	5.16	11.74
Total Instances of Multi-clause Syntax	13.15	6.73	0.00	25.00	17.21	8.55	3.00	32.00	25.08	9.97	8.00	40.00
Proportion of Multi-clause Syntax which is Coordinate	0.29	0.16	0.00	0.50	0.34	0.19	0.11	0.75	0.33	0.15	0.14	0.63
Ratio of Total Multi-clause Syntax to Propositions	0.28	0.13	0.00	0.48	0.32	0.12	0.07	0.55	0.41	0.12	0.20	0.57
Number of Instances of Coordinate Syntax	4.39	2.90	0.00	8.00	5.14	2.93	1.00	11.00	8.83	6.52	2.00	25.00
Ratio of Coordinate Syntax to Propositions	0.09	0.06	0.00	0.18	0.10	0.06	0.02	0.19	0.14	0.09	0.04	0.35
Number of Instances of Complex Syntax	8.77	4.57	0.00	19.00	12.07	7.48	1.00	27.00	16.25	6.30	6.00	27.00
Ratio of Complex Syntax to Propositions	0.18	0.08	0.00	0.33	0.22	0.11	0.03	0.47	0.26	0.08	0.15	0.40
Ratio of Complex Syntax to Utterances	0.21	0.11	0.00	0.43	0.29	0.16	0.04	0.64	0.38	0.15	0.17	0.68
Diversity of Complex Syntax Types	4.69	1.89	0.00	7.00	5.43	2.28	1.00	8.00	6.00	1.04	5.00	8.00
<i>Verb Vocabulary measures</i>												
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Number of Verb Types	19.38	5.19	12.00	28.00	23.00	3.51	16.00	29.00	25.83	4.28	18.00	32.00
Ratio of Verb Types to Propositions	0.42	0.08	0.32	0.60	0.46	0.09	0.31	0.61	0.44	0.06	0.30	0.51

Summary statistics for all children's performance on Grammatical Accuracy measures according to age group are presented in Tables 25 and 25a. In Table 25, summary statistics on the performance of all children on Grammatical Accuracy measures are presented. In Table 25a only those children who have high (78%+) Proportion Irish Input Since Birth are included. This was decided for several reasons. Proportion Irish Input Since Birth is found to be particularly influential in this language domain (see results of investigations of the relationship between language measures and independent variables below). Further, most of the children in the sample (32/39) had high Proportion Irish Input Since Birth. Finally, this was decided for practical reasons: the children who would most benefit from speech and language assessment and intervention through Irish have high Proportion Irish Input Since Birth rather than low. When there is a difference between the performance of these two groups, the mean is generally more and variation is less in Table 25a than in Table 25. This indicates higher performance in children with high Proportion Irish Input Since Birth than in children with low. Results of further investigations of the relationship between Proportion Irish Input Since Birth and Grammatical Accuracy are presented later in this chapter.

Chapter 5 Results

Table 25. Summary statistics of children's performance by Grammatical Accuracy language measure per age group.

Grammatical Accuracy Measure	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Past Tense Lenition	0.83	0.30	0.00	1.00	0.95	0.05	0.84	1.00	0.93	0.15	0.48	1.00
Past Tense Proclitic 'd'	0.69	0.43	0.00	1.00	0.96	0.11	0.67	1.00	0.88	0.31	0.00	1.00
Past Tense Proclitic 'd' (No O.C.s = Zero accuracy)	0.47	0.48	0.00	1.00	0.62	0.49	0.00	1.00	0.81	0.39	0.00	1.00
Past Tense 'bí' Lenition	0.86	0.34	0.00	1.00	0.99	0.02	0.94	1.00	0.96	0.14	0.53	1.00
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a'	0.33	0.58	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a' (No O.C.s = Zero accuracy)	0.08	0.28	0.00	1.00	0.21	0.43	0.00	1.00	0.67	0.49	0.00	1.00
Eclipsis of Verbs following the Complementiser 'go'	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eclipsis of Verbs following the Complementiser 'go' (No O.C.s = Zero accuracy)	0.15	0.38	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Future Tense of Verbs	0.33	0.58	0.00	1.00	0.86	0.38	0.00	1.00	0.92	0.24	0.33	1.00
Future Tense of Verbs (No O.C.s = Zero accuracy)	0.62	0.51	0.00	1.00	0.43	0.51	0.00	1.00	0.61	0.49	0.00	1.00
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles.	0.95	0.11	1.00	1.00	0.98	0.07	0.75	1.00	0.94	0.21	0.30	1.00
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles. (No O.C.s = Zero accuracy)	0.88	0.28	0.00	1.00	0.98	0.07	0.75	1.00	0.86	0.34	0.00	1.00
Dependent Irregular Verbs following Negative Particles	0.89	0.24	0.00	1.00	0.99	0.05	0.80	1.00	0.88	0.31	0.00	1.00
Dependent Irregular Verbs following Negative Particles (No O.C.s = Zero accuracy)	0.75	0.40	0.00	1.00	0.99	0.05	0.80	1.00	0.81	0.39	0.00	1.00

Chapter 5 Results

Table 25 continued. Summary statistics of children's performance by Grammatical Accuracy language measure per age group.

<i>Grammatical Accuracy Measure</i>	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy)	0.64	0.40	0.00	1.00	0.63	0.39	0.00	1.00	0.88	0.25	0.25	1.00
Plural Nouns	0.82	0.16	0.55	1.00	0.80	0.24	0.29	1.00	0.76	0.23	0.33	1.00
Overgeneralisation of Lenition of Nouns	1.83	2.21	0.00	6.00	1.07	1.38	0.00	5.00	2.17	2.72	0.00	8.00
Overgeneralisation of Eclipsis of Nouns	0.15	0.38	0.00	1.00	0.21	0.43	0.00	1.00	0.67	1.44	0.00	5.00
Simple Prepositions	0.94	0.08	1.00	1.00	0.92	0.06	0.80	1.00	0.86	0.12	0.65	1.00
'San' preceding Nouns beginning with Vowels	0.83	0.41	0.00	1.00	0.89	0.33	0.00	1.00	1.00	0.00	1.00	1.00
'San' preceding Nouns beginning with Vowels (No O.C.s = Zero accuracy)	0.38	0.51	0.00	1.00	0.57	0.51	0.00	1.00	0.33	0.49	0.00	1.00
'San' preceding Nouns beginning with Consonants	0.14	0.32	0.00	1.00	0.08	0.16	0.00	0.50	0.11	0.30	0.00	1.00
Simple Verbal Complement Clauses	0.57	0.54	0.00	1.00	0.97	0.08	0.75	1.00	0.94	0.17	0.50	1.00
Simple Verbal Complement Clauses (No O.C.s = Zero accuracy)	0.31	0.48	0.00	1.00	0.63	0.49	0.00	1.00	0.71	0.45	0.00	1.00
Special Word Order in Transitive Verbal Complement Clauses	0.00	0.00	0.00	0.00	0.69	0.48	0.00	1.00	0.64	0.45	0.00	1.00
Special Word Order in Transitive Verbal Complement Clauses (No O.C.s = Zero accuracy)	0.00	0.00	0.00	0.00	0.35	0.48	0.00	1.00	0.58	0.47	0.00	1.00
Direct Relative Clauses	1.00	0.00	1.00	1.00	0.91	0.17	0.50	1.00	1.00	0.00	1.00	1.00
Direct Relative Clauses (No O.C.s = Zero accuracy)	0.77	0.44	0.00	1.00	0.78	0.37	0.00	1.00	0.83	0.39	0.00	1.00

Chapter 5 Results

Table 25 continued. Summary statistics of children's performance by Grammatical Accuracy language measure per age group.

<i>Grammatical Accuracy Measure</i>	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Propositional and Adjectival Complement Clauses (No O.C.s = Zero accuracy)	0.03	0.11	0.00	0.00	0.26	0.44	0.00	1.00	0.29	0.45	0.00	1.00
Adverbial Complement Clauses	0.96	0.12	1.00	1.00	0.83	0.36	0.00	1.00	0.86	0.18	0.44	1.00
Adverbial Complement Clauses (No O.C.s = Zero accuracy)	0.59	0.49	0.00	1.00	0.60	0.49	0.00	1.00	0.72	0.37	0.00	1.00
Direct Speech Complement Clauses	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Direct Speech Complement Clauses (No O.C.s = Zero accuracy)	0.92	0.28	0.00	1.00	0.86	0.36	0.00	1.00	0.83	0.39	0.00	1.00
Pseudo-cleft Constructions	0.33	0.58	0.00	1.00	0.64	0.38	0.00	1.00	0.89	0.19	0.67	1.00
Pseudo-cleft Constructions (No O.C.s = Zero accuracy)	0.08	0.28	0.00	1.00	0.32	0.42	0.00	1.00	0.22	0.41	0.00	1.00
Preverbal Particles	0.98	0.06	1.00	1.00	0.96	0.10	0.67	1.00	0.98	0.04	0.90	1.00
Preverbal Particles (No O.C.s = Zero accuracy)	0.98	0.06	1.00	1.00	0.96	0.10	0.67	1.00	0.98	0.04	0.90	1.00
Adjective Agreement with Plural Nouns	0.69	0.46	0.00	1.00	1.00	0.00	1.00	1.00	0.72	0.43	0.00	1.00
Adjective Agreement with Plural Nouns (No O.C.s = Zero accuracy)	0.42	0.49	0.00	1.00	0.36	0.50	0.00	1.00	0.66	0.46	0.00	1.00
'ag' preceding Verbal Nouns	0.67	0.32	0.00	1.00	0.76	0.20	0.40	1.00	0.75	0.23	0.40	1.00
Article Agreement with Plural Nominative Case Nouns	0.78	0.40	0.00	1.00	0.64	0.47	0.00	1.00	0.70	0.39	0.00	1.00
Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero Accuracy)	0.66	0.47	0.00	1.00	0.60	0.49	0.00	1.00	0.70	0.39	0.00	1.00

Chapter 5 Results

Table 25a. Summary statistics of high Irish input children's performance by Grammatical Accuracy language measures per age group.

<i>Grammatical Accuracy Measure</i>	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Past Tense Lenition	0.97	0.06	1.00	1.00	0.96	0.05	0.84	1.00	0.97	0.03	0.91	1.00
Past Tense Proclitic 'd'	0.79	0.39	0.00	1.00	0.96	0.12	0.67	1.00	0.96	0.11	0.67	1.00
Past Tense Proclitic 'd' (No O.C.s = Zero accuracy)	0.55	0.50	0.00	1.00	0.64	0.48	0.00	1.00	0.87	0.32	0.00	1.00
Past Tense 'bí' Lenition	1.00	0.00	1.00	1.00	1.00	0.01	0.96	1.00	1.00	0.00	1.00	1.00
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a'	0.33	0.58	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a' (No O.C.s = Zero accuracy)	0.10	0.32	0.00	1.00	0.17	0.39	0.00	1.00	0.80	0.42	0.00	1.00
Eclipsis of Verbs following the Complementiser 'go'	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eclipsis of Verbs following the Complementiser 'go' (No O.C.s = Zero accuracy)	0.20	0.42	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Future Tense of Verbs	0.60	0.52	0.00	1.00	0.83	0.41	0.00	1.00	0.92	0.24	0.33	1.00
Future Tense of Verbs (No O.C.s = Zero accuracy)	0.60	0.52	0.00	1.00	0.42	0.51	0.00	1.00	0.73	0.44	0.00	1.00
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles.	0.99	0.04	1.00	1.00	0.98	0.07	0.75	1.00	0.92	0.23	0.30	1.00
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles. (No O.C.s = Zero accuracy)	0.99	0.04	1.00	1.00	0.98	0.07	0.75	1.00	0.83	0.37	0.00	1.00
Dependent Irregular Verbs following Negative Particles	0.99	0.04	1.00	1.00	0.98	0.06	0.80	1.00	0.96	0.11	0.67	1.00
Dependent Irregular Verbs following Negative Particles (No O.C.s = Zero accuracy)	0.89	0.31	0.00	1.00	0.98	0.06	0.80	1.00	0.87	0.32	0.00	1.00

Chapter 5 Results

Table 25a continued. Summary statistics of high Irish input children's performance by Grammatical Accuracy language measures per age group.

<i>Grammatical Accuracy Measure</i>	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Masculine Possessive Pronoun Lenition of Nouns	0.81	0.20	1.00	1.00	0.82	0.21	0.50	1.00	0.93	0.17	0.50	1.00
Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy)	0.73	0.31	0.00	1.00	0.68	0.37	0.00	1.00	0.93	0.17	0.50	1.00
Plural Nouns	0.85	0.14	0.67	1.00	0.85	0.20	0.29	1.00	0.76	0.26	0.33	1.00
Overgeneralisation of Lenition of Nouns	2.22	2.39	0.00	6.00	1.08	1.44	0.00	5.00	2.30	2.91	0.00	8.00
Overgeneralisation of Eclipsis of Nouns	0.20	0.42	0.00	1.00	0.17	0.39	0.00	1.00	0.70	1.57	0.00	5.00
Simple Prepositions	0.94	0.09	1.00	1.00	0.92	0.06	0.80	1.00	0.87	0.12	0.65	1.00
'San' preceding Nouns beginning with Vowels	1.00	0.00	1.00	1.00	0.86	0.38	0.00	1.00	1.00	0.00	1.00	1.00
'San' preceding Nouns beginning with Vowels (No O.C.s = Zero accuracy)	0.40	0.52	0.00	1.00	0.50	0.52	0.00	1.00	0.40	0.52	0.00	1.00
'San' preceding Nouns beginning with Consonants	0.00	0.00	0.00	0.00	0.08	0.17	0.00	0.50	0.14	0.33	0.00	1.00
Simple Verbal Complement Clauses	0.60	0.55	0.00	1.00	0.96	0.09	0.75	1.00	0.94	0.18	0.50	1.00
Simple Verbal Complement Clauses (No O.C.s = Zero accuracy)	0.30	0.48	0.00	1.00	0.56	0.50	0.00	1.00	0.75	0.42	0.00	1.00
Special Word Order in Transitive Verbal Complement Clauses	0.00	0.00	0.00	0.00	0.81	0.40	0.00	1.00	0.78	0.36	0.00	1.00
Special Word Order in Transitive Verbal Complement Clauses (No O.C.s = Zero accuracy)	0.00	0.00	0.00	0.00	0.40	0.50	0.00	1.00	0.70	0.42	0.00	1.00
Direct Relative Clauses	1.00	0.00	1.00	1.00	0.89	0.18	0.50	1.00	1.00	0.00	1.00	1.00
Direct Relative Clauses (No O.C.s = Zero accuracy)	0.80	0.42	0.00	1.00	0.74	0.39	0.00	1.00	0.90	0.32	0.00	1.00

Chapter 5 Results

Table 25a continued. Summary statistics of high Irish input children's performance by Grammatical Accuracy language measures per age group.

<i>Grammatical Accuracy Measure</i>	3 year olds				4 year olds				5 and 6 year olds			
	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum	Mean	SD	Minimum	Maximum
Propositional and Adjectival Complement Clauses	0.40	0.38	0.40	0.40	0.38	0.49	0.00	1.00	0.35	0.47	0.00	1.00
Propositional and Adjectival Complement Clauses (No O.C.s = Zero accuracy)	0.04	0.13	0.00	0.00	0.22	0.41	0.00	1.00	0.35	0.47	0.00	1.00
Adverbial Complement Clauses	0.94	0.14	1.00	1.00	0.79	0.40	0.00	1.00	0.91	0.11	0.75	1.00
Adverbial Complement Clauses (No O.C.s = Zero accuracy)	0.57	0.50	0.00	1.00	0.53	0.50	0.00	1.00	0.82	0.31	0.00	1.00
Direct Speech Complement Clauses	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00
Direct Speech Complement Clauses (No O.C.s = Zero accuracy)	0.90	0.32	0.00	1.00	0.83	0.39	0.00	1.00	0.80	0.42	0.00	1.00
Pseudo-cleft Constructions	0.50	0.71	0.00	1.00	0.67	0.41	0.00	1.00	0.89	0.19	0.67	1.00
Pseudo-cleft Constructions (No O.C.s = Zero accuracy)	0.10	0.32	0.00	1.00	0.33	0.44	0.00	1.00	0.27	0.44	0.00	1.00
Preverbal Particles	0.98	0.07	1.00	1.00	0.95	0.11	0.67	1.00	0.99	0.03	0.91	1.00
Preverbal Particles (No O.C.s = Zero accuracy)	0.98	0.07	1.00	1.00	0.95	0.11	0.67	1.00	0.99	0.03	0.91	1.00
Adjective Agreement with Plural Nouns	0.75	0.42	0.00	1.00	1.00	0.00	1.00	1.00	0.66	0.45	0.00	1.00
Adjective Agreement with Plural Nouns (No O.C.s = Zero accuracy)	0.45	0.50	0.00	1.00	0.42	0.51	0.00	1.00	0.59	0.47	0.00	1.00
'ag' preceding Verbal Nouns	0.66	0.34	0.00	1.00	0.75	0.20	0.40	1.00	0.70	0.21	0.40	1.00
Article Agreement with Plural Nominative Case Nouns	0.85	0.34	0.00	1.00	0.67	0.46	0.00	1.00	0.82	0.30	0.00	1.00
Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero Accuracy)	0.77	0.42	0.00	1.00	0.61	0.48	0.00	1.00	0.82	0.30	0.00	1.00

5.3 Productivity

5.3.1 Productivity: correlation tests

Parametric (Pearson's) and non-parametric (Spearman's rho) bivariate correlations for Productivity measures and five independent variables: Age in months (Age), Proportion of Irish Input Since Birth (Irish Input), Birth Order, Gender and Maternal Education are presented in Table 26.

The main finding presented in this table is that Productivity increases with Age. Using the Spearman's rho (P) correlation test, a significant ($p < .05$) positive correlation is found for six out of seven measures of Productivity with Age. Using Pearson's product-moment correlation test (r), at the same level of significance, 5 out of 7 measures are found to correlate positively with Age. The correlation between Number of T-Units and Age approaches significance using Pearson's r [$r = .28$, $p = .085$] and achieves significance using Spearman's rho [$P = .38$, $p = .016$]. This discrepancy between test results may be a reflection of the slightly right skewed distribution of Number of T-Units [Shapiro Wilk statistic = $.93$, $p = .018$]. This non-normal distribution makes it more difficult for the Pearson's r test (which assumes normality) to identify a linear relationship. A significant correlation is not found between Number of Utterances and Age using either test.

The second most interesting finding presented in this table is the pattern evident in the directions of relationships between Productivity measures and other independent variables. Using both Pearson's and Spearman's rho, six out of seven correlations between Productivity measures and Birth Order are found to be negative. These relationships are insignificant. Nevertheless, given the high consistency in the direction of the relationships, perhaps an increased sample size would result in some of these correlations becoming significant. Such relationships would indicate that later born children are more productive than first born children. Using both Pearson's and Spearman's rho, six out of seven correlations between Productivity measures and Gender are found to be positive. These relationships are

insignificant but perhaps an increased sample size would result in some of these correlations becoming significant. Such relationships would indicate that girls are more productive than boys. Maternal Education may negatively affect some measures of Productivity and improve others. Using both Pearson's and Spearman's rho, four out of seven measures of Productivity (Number of Words in Utterances, Number of T-Units, Number of Propositions and Number of Utterances) are found to correlate negatively but insignificantly with Maternal Education. The most interesting of these is Number of Utterances because it approaches significance [$r = -.30$, $p = .072$]. The other three (Number of Words in T-Units, Number of Words in Propositions and MLP in words) correlate positively, one approaching significance: MLP in words [$r = .30$, $p = .075$] suggesting a probable non-linear relationship between these this measure and Maternal Education.

Finally, correlations between Productivity measures and Irish Input are very weak and neither achieve nor approach significance suggesting no effect of Irish Input on Productivity measures.

Chapter 5 Results

Table 26. Bivariate correlations for Productivity measures and five independent variables.

<i>Productivity measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Number of Words in T-Units	.48** (.002)	.08 (.616)	-.26 (.115)	.11 (.504)	.03 (.870)	.52** (.001)	.11 (.518)	-.26 (.110)	.15 (.379)	.04 (.828)
Number of Words in Propositions	.48** (.002)	.073 (.658)	-.26 (.118)	.11 (.490)	.02 (.929)	.53** (.001)	.09 (.581)	-.26 (.117)	.15 (.356)	.02 (.893)
Number of Words in Utterances	.44** (.006)	.023 (.889)	-.24 (.143)	.11 (.495)	-.00 (.994)	.49** (.002)	.09 (.572)	-.25 (.128)	.14 (.395)	-.00 (.987)
Number of T-Units	.28* (.085)	-.01 (.969)	-.21 (.192)	.19 (.240)	-.21 (.208)	.38** (.016)	.00 (.981)	-.18 (.287)	.22 (.176)	-.13 (.429)
Number of Propositions	.37** (.021)	.05 (.785)	-.21 (.192)	.19 (.247)	-.11 (.519)	.43** (.007)	.05 (.776)	-.17 (.307)	.23 (.162)	-.09 (.579)
Number of Utterances	.04 (.822)	-.03 (.878)	.03 (.878)	.29* (.071)	-.30* (.072)	.14 (.381)	-.09 (.587)	.13 (.434)	.23 (.167)	-.15 (.390)
MLP in Words	.39** (.015)	.09 (.595)	-.24 (.145)	-.17 (.306)	.24 (.151)	.35** (.030)	-.04 (.814)	-.19 (.257)	-.18 (.271)	.30* (.075)

Note: MLP = Mean Length of Propositions ** p<.05; * p between .05 and .99.

5.3.2 Productivity: distribution and trend tests

The results of distribution and trend tests on Productivity measures across levels of the five independent variables are presented in Tables 27 and 27a. These five independent variables are Age, Irish Input, Birth Order, Gender and Maternal Education.

The main finding presented in these tables is the positive relationship between Productivity measures and Age. This is evident in Table 27. Investigation of this relationship using a Kruskal-Wallis test reveals significant effects of Age group [across all three groups: three year olds, four year olds and five and six year olds] in the case of all six Productivity measures which correlate with Age. Further, Jonckheere trend tests reveal a significant and positive trend across age groups for all six of these Productivity measures.

In Table 27a, differences in Productivity across groups of other independent variables (Irish Input, Birth Order, Gender and Maternal Education) do not reach significance however, as in correlations, interesting patterns are still evident and this is the second most important finding in these tables. Jonckheere trend tests show similar directions to those found in correlation tests. These statistics again suggest that if a larger sample size returned significant results they would support an advantage of later born children and girls in Productivity. Jonckheere trend test statistic directions indicated for Maternal Education and Irish Input are more mixed. A positive trend in MLP in Words across Maternal Education groups approaches significance indicating that if a significant difference in distribution was found in a larger sample, MLP in Words would, consistent with Spearman's rho correlation test, be found to increase with Maternal Education. Finally, relationships between Productivity and Irish Input are again very weak and neither achieve nor approach significance.

Correlation, distribution and trend tests indicate that Productivity measures have a positive relationship with Age. Tests also indicate probable trend

directions for Productivity measures in relation to other independent variables. However, in order to control for other variables and their possible relationships with Productivity measures, multiple regression analyses need to be conducted.

Chapter 5 Results

Table 27. Kruskal Wallis and Jonckheere trend statistics for Productivity measures across Age groups.

<i>Productivity measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years .		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Number of Words in T-Units	11.49** (.003)	3.49** (.000)	10.21** (.001)	3.20** (.001)	6.27** (.012)	2.50** (.012)
Number of Words in Propositions	11.57** (.003)	3.48** (.000)	10.41** (.001)	3.23** (.001)	6.12** (.013)	2.47** (.013)
Number of Words in Utterances	10.28** (.006)	3.27** (.001)	9.26** (.002)	3.04** (.002)	5.40** (.020)	2.32** (.020)
Number of T-Units	6.08** (.048)	2.47** (.014)	5.37** (.021)	2.32** (.021)	3.37* (.066)	1.84* (.066)
Number of Propositions	7.14** (.028)	2.65** (.008)	6.32** (.012)	2.51** (.012)	3.94** (.047)	1.98** (.047)
Number of Utterances	.98 (.612)	.74 (.462)	.98 (.322)	.99 (.322)	2.00 (.654)	.448 (.654)
MLP in Words	7.71** (.021)	2.63** (.009)	7.25** (.007)	2.69** (.007)	3.47* (.063)	1.86* (.063)

Note : MLP = Mean Length of Propositions ; ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 27a. Kruskal Wallis and Jonckheere trend statistics for Productivity measures across Input, Birth Order, Gender and Maternal Education groups.

<i>Productivity measures</i>	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Number of Words in T-Units	.13 (.714)	.37 (.714)	2.56 (.109)	-1.60 (.109)	.80 (.372)	.89 (.372)	.05 (.824)	.22 (.824)
Number of Words in Propositions	.09 (.770)	.29 (.770)	2.47 (.116)	-1.57 (.116)	.88 (.349)	.94 (.349)	.32 (.572)	-.57 (.572)
Number of Words in Utterances	.11 (.742)	.33 (.742)	2.34 (.126)	-1.53 (.126)	.75 (.388)	.86 (.388)	.00 (.986)	-.02 (.986)
Number of T-Units	.11 (.741)	-.33 (.741)	1.16 (.281)	-1.08 (.281)	1.86 (.173)	1.36 (.173)	.65 (.421)	-.81 (.421)
Number of Propositions	.01 (.912)	.11 (.912)	1.07 (.301)	-1.04 (.301)	1.98 (.159)	1.41 (.159)	.32 (.572)	-.565 (.572)
Number of Utterances	.51 (.475)	-.72 (.475)	.63 (.427)	.79 (.427)	1.94 (.164)	1.39 (.164)	.76 (.382)	-.87 (.382)
MLP in Words	.11 (.742)	-.33 (.742)	1.32 (.251)	-1.15 (.251)	1.24 (.266)	-1.11 (.266)	3.16* (.075)	1.78* (.075)

Note: MLP = Mean Length of Propositions ; ** p<.05; * p between .05 and .99

5.3.3 Productivity: multiple regression analyses

The results of multiple regression analyses with Productivity measures as outcome variables and Age, Irish Input, Birth Order, Gender and Maternal Education as predictor variables are presented in Table 28.

Using the Enter method, the combination of the five predictor variables emerges as a significant explanatory model for these three measures of productivity (Number of Words in T-Units: $F = 3.24$, $p = .018$, $R^2 = .343$; Number of Words in Propositions: $F = 3.18$, $p = .020$, $R^2 = .339$ and MLP in Words: $F = 2.65$, $p = .042$, $R^2 = .299$) indicating that these are the productivity measures in this study which are most related to well motivated independent variables. It is worth noting that this explanatory model also approaches significance for Number of Words in Utterances [$F = 2.53$, $p = .050$, $R^2 = .290$]. The main finding presented in this table is the identification of the three most important measures of Productivity (Number of Words in T-Units; Number of Words in Propositions; MLP in Words).

Another important finding is that, even when the effect of other predictor variables is taken into account, Age is again found to be the strongest predictor variable for each of the six Productivity measures found to be related to Age in other tests. This is gauged on the basis of a comparison of absolute values of standardised Beta coefficients of Age to those of other potential predictor variables in Table 28.

The second strongest predictor variable is Birth Order. Birth Order reaches significance as a predictor for two productivity measures: Number of Words in T-Units [$B = -48.56$, $p = .048$] and Number of Words in Propositions [$B = -49.14$, $p = .048$]. It approaches significance as a predictor variable for two other productivity measures: MLP in Words [$B = -.39$, $p = .050$]; Number of Words in Utterances [$B = -47.87$, $p = .064$]. Consistent with results of other tests, the negative direction of relationships with

Productivity measures indicates that, when a difference exists, the later born children are more productive than their first born peers.

Finally, Gender is the only other variable which approaches significance as a predictor variable for Productivity measures: Number of Words in T-Units [B = 46.83, p = .085]; Number of Words in Propositions [B = 47.41, p = .085]. Again direction is consistent with results of other tests suggesting a possible advantage for girls over boys in productivity. When the effects of other independent variables are taken into account in multiple linear regression analyses, neither Irish Input nor Maternal Education play an explanatory role in Productivity measures.

Chapter 5 Results

Table 28. Multiple regression coefficients for the prediction of Productivity measures.

<i>Productivity measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
Number of Words in T-Units	3.24** (.018)	0.343	103.51 (.147)	3.72** (.001) [+] Std. B: .55	-8.91 (.875) [+] Std. B: -.03	-48.56** (.048) [+] Std. B: -.32	46.83* (.085) [+] Std. B: .30	2.81 (.926) [+] Std. B: .02
Number of Words in Propositions	3.18** (.020)	0.339	107.45 (.138)	3.73** (.001) [+] Std. B: .54	-10.70 (.852) [+] Std. B: -.03	-49.14** (.048) [+] Std. B: -.32	47.41* (.085) [+] Std. B: .30	1.21 (.969) [+] Std. B: .01
Number of Words in Utterances	2.53* (.050)	0.29	145.63* (.057)	3.43** (.004) [+] Std. B: .50	-28.97 (.630) [+] Std. B: -.09	-47.87* (.064) [+] Std. B: -.31	46.18 (.108) [+] Std. B: .29	3.40 (.915) [+] Std. B: .02
Number of T-Units	1.75 (.154)	0.22	35.19** (.004)	.37** (.032) [+] Std. B: .37	-1.47 (.871) [+] Std. B: -.03	-5.67 (.143) [+] Std. B: -.26	5.52 (.201) [+] Std. B: .24	-5.07 (.300) [+] Std. B: -.20
Number of Propositions	2.00 (.107)	0.244	32.53** (.017)	.53** (.010) [+] Std. B: .45	-1.28 (.903) [+] Std. B: -.02	-6.50 (.145) [+] Std. B: -.25	7.47 (.134) [+] Std. B: .28	3.10 (.579) [+] Std. B: -.11
Number of Utterances	.91 (.490)	0.127	40.91** (.001)	.08 (.629) [+] Std. B: .09	1.44 (.868) [+] Std. B: .03	1.08 (.766) [+] Std. B: .032	3.57 (.381) [+] Std. B: -.05	-5.96 (.202) [+] Std. B: -.17
MLP in Words	2.65** (.042)	0.299	3.88** (.000)	.02** (.011) [+] Std. B: .43	-.09 (.854) [+] Std. B: -.03	-.39* (.050) [+] Std. B: -.33	.14 (.511) [+] Std. B: .12	.26 (.303) [+] Std. B: .19

Note: MLP = Mean Length of Propositions. ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

5.3.4 Productivity: summary

In summary, Productivity increases with Age across all three sets of tests, parametric and non-parametric, including when other variables are controlled for in multiple regression analyses. Also, despite Birth Order having shown little association with Productivity measures in other tests, when other independent variables are controlled for, Birth Order is revealed as a predictor of secondary importance for some measures of Productivity (Number of Words in T-Units, Number of Words in Propositions and, with less certainty, Number of Words in Utterances and MLP in Words). Finally, if sample size is increased, Gender may be found to play more of a role in Productivity (at least for two measures). The weakness and insignificance of the relationships with Irish Input suggest that Productivity measures are language universal (i.e. unaffected by proportion Input in each language) at least at the age and level of cumulative Irish input amassed by the children in this study. Finally, the near significant relationship found between Maternal Education and MLP in Words in non-parametric correlation and distribution and trend tests is not reflected in results of multiple regression analyses. This may be simply because when other potential predictor variables are accounted for, Maternal Education no longer has an effect on MLP in Words. Alternatively it may be the case that this multiple linear regression analysis does not pick up on a true relationship between MLP in Words and Maternal Education because of its assumption that the data is normally distributed (which is not the case in binary variables such as Maternal Education in this study).

As previously stated, the most useful measures of Productivity in terms of established statistical interdependencies: Number of Words in T-Units; Number of Words in Propositions; MLP in Words are identified by relatively high R Square coefficients (0.343; 0.339; 0.299 respectively) in results of multiple regression analyses. This evidence of established statistical interdependence is corroborated by evidence across the other tests. Number of Words in T-Units and Number of Words in Propositions have

the strongest relationships with Age in correlation (see Table 26), distribution and trend tests (see Table 27). Number of Words in Utterances followed by MLP in Words came next (see Tables 26 and 27), but when effects of other variables were taken into account in multiple regression analyses (see Table 28), MLP in Words and not Number of Words in Utterances prevailed.

Taking these findings together, Productivity measures such as Number of Words in T-Units, Number of Words in Propositions and MLP in Words present as useful ways of capturing language proficiency in the population examined.

5.4 Multi-clause Syntax

5.4.1 Multi-clause Syntax: correlation tests

Parametric and non-parametric bivariate correlations for Multi-clause Syntax measures and five independent variables: Age, Irish Input, Birth Order, Gender and Maternal Education are presented in Table 29.

The main finding presented in this table is that Multi-clause Syntax increases with Birth Order and Age indicating that later born children use more Multi-clause Syntax (coordinate and complex) than first born children and also that Multi-clause Syntax develops with Age. Nine out of eleven Multi-clause Syntax measures are found to have significant relationships either with Birth Order, with Age or with both. Four had significant relationships with Birth Order (Proportion of Multi-clause Syntax which is Coordinate, Ratio of Total Multi-clause Syntax to Propositions, Number of Instances of Coordinate Syntax, Ratio of Coordinate Syntax to Propositions), two with Age (MLTU in Words, Number of Instances of Complex Syntax) and three with both (MLU in Words, Total Instances of Multi-Clause Syntax, Ratio of Complex Syntax to Utterances). Relationships between Age and Ratio of Total Multi-clause Syntax to Propositions and Ratio of Complex Syntax to Propositions approaches significance using Pearson's r and reaches significance using Spearman's ρ and therefore may be non-linear. The relationship between Age and Number of Instances of Coordinate Syntax nears significance.

The next most important findings presented in this table are the significant relationships found between two measures of Multi-clause Syntax and Gender and Maternal Education. Across the two correlation tests, Mean Length of T-Units (MLTU) in Words has significant positive relationships with Maternal Education as well as with Age indicating an advantage for children with high Maternal Education as well as older children. Proportion of Multi-clause Syntax which is Coordinate correlates significantly with Gender as well as Birth Order indicating that coordinate syntax is more

frequent in boys and later born children. Such superiority is generally considered to be a sign of immaturity, however the results of further investigation (outlined in *Multi-clause Syntax: multiple regression analyses* section) will contradict this assumption in the case of later born children. Relationships which approach significance are Ratio of Coordinate Syntax to Propositions and Gender and Diversity of Complex Syntax and Maternal Education. These near significant relationships support the abovementioned relative advantages.

Finally, in general, measures of Multi-clause Syntax improve with Irish Input. Although the Pearson's r test does not return a significant relationship between Irish Input and any Multi-clause Syntax measure, significant positive relationships are identified between Irish Input and three Multi-clause Syntax measures (Number of Instances of Complex Syntax, Ratio of Complex Syntax to Propositions, Ratio of Complex Syntax to Utterances) when Spearman's ρ is conducted. Also, some other measures of Multi-clause Syntax approach significant positive non-parametric correlations with Irish Input: Ratio of Total Multi-clause Syntax to Propositions and Total Instances of Multi-clause Syntax.

Chapter 5 Results

Table 29. Bivariate correlations for Multi-clause Syntax measures and five independent measures.

<i>Multi-clause Syntax measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
MLTU in Words	.48** (.002)	.18 (.270)	-.22 (.188)	-.13 (.445)	.35** (.032)	.51** (.001)	.10 (.532)	-.16 (.321)	-.08 (.625)	.37** (.026)
MLU in Words	.43** (.006)	.08 (.634)	-.36** (.025)	-.13 (.433)	.22 (.192)	.49** (.002)	.07 (.696)	-.34** (.034)	-.14 (.387)	.23 (.175)
Total Instances of Multi-clause Syntax	.42** (.007)	.08 (.645)	-.41** (.009)	.03 (.839)	.09 (.605)	.43** (.006)	.27* (.097)	-.40** (.011)	.07 (.655)	.05 (.788)
Proportion of Multi-clause Syntax which is Coordinate	.07 (.657)	.01 (.953)	-.38** (.018)	-.40** (.011)	.23 (.178)	.06 (.739)	-.24 (.151)	-.35** (.029)	-.36** (.025)	.18 (.287)
Ratio of Total Multi-clause Syntax to Propositions	.30* (.060)	.09 (.598)	-.43** (.007)	-.03 (.859)	.15 (.367)	.32** (.047)	.27* (.099)	-.48** (.002)	-.03 (.840)	.09 (.579)
Number of Instances of Coordinate Syntax	.30* (.066)	-.08 (.643)	-.41** (.009)	-.22 (.184)	.09 (.608)	.29* (.073)	-.04 (.790)	-.44** (.005)	-.12 (.487)	.12 (.488)
Ratio of Coordinate Syntax to Propositions	.19 (.253)	-.06 (.700)	-.42** (.008)	-.28* (.088)	.14 (.422)	.16 (.331)	-.06 (.729)	-.44** (.005)	-.21 (.191)	.13 (.428)
Number of Instances of Complex Syntax	.40** (.013)	.16 (.332)	-.30* (.061)	.20 (.233)	.06 (.708)	.43** (.006)	.35** (.031)	-.29* (.073)	.19 (.257)	-.00 (.987)
Ratio of Complex Syntax to Propositions	.27* (.098)	.17 (.312)	-.26 (.109)	.18 (.275)	.11 (.501)	.35** (.032)	.42** (.008)	-.25 (.120)	.13 (.444)	.09 (.602)
Ratio of Complex Syntax to Utterances	.37** (.022)	.18 (.281)	-.33** (.038)	.12 (.453)	.13 (.449)	.44** (.005)	.38** (.018)	-.33** (.040)	.06 (.698)	.12 (.491)
Diversity of Complex Syntax Types	.19 (.259)	.11 (.519)	-.03 (.852)	.12 (.480)	.26 (.121)	.24 (.149)	.23 (.155)	-.02 (.898)	.09 (.584)	.29* (.084)

Note: ** p<.05; * p between .05 and .99.

5.4.2 Multi-clause Syntax: distribution and trend tests

The results of distribution and trend tests on Multi-clause syntax measures across levels of the five independent variables: Age, Irish Input, Birth Order, Gender and Maternal Education are presented in Tables 30 and 30a

The main findings presented in these tables are that Multi-clause Syntax increases with Age and with Birth Order. Investigation of the relationship between Age and Multi-clause Syntax using a Kruskal-Wallis test reveals significant effects of age group (across all three groups: three year olds , four year olds and five and six year olds) in the case of the five Multi-clause Syntax measures. These have already been found to have a relationship with Age across both correlation tests. Consistent with Spearman's rho correlation results, the more statistically powerful Jonckheere trend test reveals significant effects across the three age groups on three more measures of Multi-clause Syntax (Ratio of Total Multi-clause Syntax to Propositions, Number of Instances of Coordinate Syntax and Ratio of Complex Syntax to Propositions). Investigation of the relationship between Birth Order and Multi-clause Syntax using a Kruskal-Wallis test reveals significant effects of Birth Order in the cases of the seven Multi-clause Syntax measures which have been found to correlate with Birth Order. Similar to results of correlation tests, another measure, Number of Instances of Complex Syntax, approaches significance. A Jonckheere trend test reveals that the trend is negative, again indicating that Multi-clause Syntax (both coordinate and complex) is more frequent in later born children than in first born children.

Similar to results of correlation tests, other interesting findings presented in these tables are that boys produced more coordinate syntax than girls (relative to their total use of Multi-clause Syntax) and that children with higher Maternal Education held an advantage in particular Multi-clause Syntax measures (MLTU in Words and possibly also Diversity of Complex Syntax). Relationships between Multi-clause Syntax and Irish Input are found to be positive but weak and insignificant.

Correlation, distribution and trend tests indicate that Birth Order and Age have relationships with many Multi-clause Syntax measures and that Gender and Maternal Education have relationships with one Multi-clause Syntax measure each. In order to control for other variables and their possible relationships with Multi-clause Syntax measures, multiple regression analyses are undertaken.

Chapter 5 Results

Table 30. Kruskal Wallis and Jonckheere trend statistics for Multi-clause Syntax measures across Age groups.

<i>Multi-clause Syntax measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years .		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
MLTU in Words	12.13** (.002)	3.44** (.001)	9.54** (.002)	3.09** (.002)	8.27** (.004)	2.88** (.004)
MLU in Words	11.64** (.003)	3.51** (.000)	9.63** (.002)	3.10** (.002)	7.35** (.007)	2.71** (.007)
Total Instances of Multi-Clause Syntax	8.39** (.015)	2.90** (.004)	7.21** (.007)	2.68** (.007)	4.95** (.026)	2.23** (.026)
Proportion of Multi-clause Syntax which is Coordinate	.23 (.892)	.41 (.679)	.05 (.831)	.21 (.831)	.23 (.633)	.48 (.633)
Ratio of Total Multi-clause Syntax to Propositions	5.46* (.065)	2.38** (.017)	4.30** (.038)	2.07** (.038)	3.71* (.054)	1.93* (.054)
Number of Instances of Coordinate Syntax	4.23 (.120)	1.99** (.047)	3.97** (.046)	1.99** (.046)	1.95 (.163)	1.40 (.163)
Ratio of Coordinate Syntax to Propositions	1.78 (.411)	1.25 (.210)	1.72 (.190)	1.31 (.190)	.70 (.403)	.84 (.403)
Number of Instances of Complex Syntax	7.98** (.019)	2.78** (.005)	6.27** (.012)	2.50** (.012)	5.44** (.020)	2.33** (.020)
Ratio of Complex Syntax to Propositions	5.64* (.060)	2.35** (.019)	4.23** (.040)	2.06** (.040)	4.06** (.044)	2.02** (.044)
Ratio of Complex Syntax to Utterances	8.85** (.012)	3.02** (.003)	6.54** (.011)	2.56** (.011)	6.49** (.011)	2.55** (.011)
Diversity of Complex Syntax Types	3.06 (.216)	1.65 (.100)	1.57 (.211)	1.25 (.211)	2.79* (.095)	1.67* (.095)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 30a. Kruskal Wallis and Jonckheere trend statistics for Multi-clause Syntax measures across Irish Input, Birth Order, Gender and Maternal Education groups .

<i>Multi-clause Syntax measures</i>	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
MLTU in Words	.68 (.410)	.82 (.410)	1.01 (.315)	-1.01 (.315)	.25 (.619)	-.50 (.619)	4.79** (.029)	2.19** (.029)
MLU in Words	.39 (.534)	.62 (.534)	4.39** (.036)	-2.10** (.036)	.77 (.380)	-.88 (.380)	1.87 (.171)	1.37 (.171)
Total Instances of Multi-Clause Syntax	1.34 (.248)	1.16 (.248)	6.17** (.013)	-2.48** (.013)	.21 (.649)	.46 (.649)	.08 (.784)	.27 (.784)
Proportion of Multi-clause Syntax which is Coordinate	.01 (.912)	.11 (.912)	4.65** (.031)	-2.16** (.031)	4.90** (.027)	-2.21** (.027)	1.17 (.280)	1.08 (.280)
Ratio of Total Multi-clause Syntax to Propositions	.84 (.359)	.92 (.359)	8.80** (.003)	-2.97** (.003)	.04 (.837)	-.21 (.837)	.32 (.572)	.57 (.572)
Number of Instances of Coordinate Syntax	.31 (.580)	.55 (.580)	7.49** (.006)	-2.74** (.006)	.50 (.479)	-.71 (.479)	.50 (.480)	.71 (.480)
Ratio of Coordinate Syntax to Propositions	.07 (.797)	.26 (.797)	7.27** (.007)	-2.70** (.007)	1.74 (.187)	-1.32 (.187)	.65 (.421)	.81 (.421)
Number of Instances of Complex Syntax	.81 (.368)	.90 (.368)	3.21* (.073)	-1.79* (.073)	1.31 (.252)	1.15 (.252)	.00 (.986)	-.02 (.986)
Ratio of Complex Syntax to Propositions	1.29 (.256)	1.14 (.256)	2.435 (.119)	-1.56 (.119)	.60 (.437)	.78 (.437)	.28 (.595)	.53 (.595)
Ratio of Complex Syntax to Utterances	1.42 (.234)	1.19 (.234)	4.16** (.041)	-2.04** (.041)	.31 (.578)	.56 (.578)	.49 (.483)	.70 (.483)
Diversity of Complex Syntax Types	.72 (.397)	.85 (.397)	.02 (.896)	-.13 (.896)	.16 (.693)	.40 (.693)	2.98* (.084)	1.73* (.084)

Note: ** p<.05; * p between .05 and .99

5.4.3 Multi-clause Syntax: multiple regression analyses

The results of multiple regression analyses with Multi-clause Syntax measures as outcome variables and Age, Irish Input, Birth Order, Gender and Maternal Education as predictor variables are presented in Table 31.

Using the Enter method, the combination of the five predictor variables emerges as a significant explanatory model for these seven measures indicating their usefulness as measures of language development. This explanatory model also approaches significance for Proportion of Multi-clause Syntax which is Coordinate and for Ratio of Coordinate Syntax to Propositions. The main finding presented in this table is the identification of the most useful measures of Multi-clause Syntax (in order of descending importance based on R Square values: Mean Length of Utterance (MLU) in Words, MLTU in Words, Total Instances of Multi-clause Syntax, Ratio of Complex Syntax to Utterances, Number of Instances of Complex Syntax, Number of Instances of Coordinate Syntax and Ratio of Total Multi-clause Syntax to Propositions).

Another important finding is that, consistent with previous tests in the current study, Age and Birth Order are found to be the strongest predictor variables for Multi-clause Syntax measures. Later born children are found to use more Multi-clause Syntax than first born peers and Multi-clause Syntax is found to increase with Age. Whereas Age is found to be the strongest individual predictor of Productivity measures and Birth Order is found to be in second place, with regard to Multi-clause Syntax, Birth Order and Age switch places in order of importance. Multiple regression analyses reveal that Birth Order is the strongest predictor of Multi-clause Syntax overall with Age coming in close second place. Consistent with previous tests, Birth Order is found to be a significant predictor for eight out of eleven measures of Multi-clause Syntax and to approach significance for two more. Age is a significant predictor for five measures of Multi-clause Syntax and approaches significance for three more. Based on a comparison of standardised Beta coefficients (across predictor variables in Table 31), Birth

Order is found to be the strongest predictor variable for five Multi-clause Syntax Measures and Age for four.

Next, relationships between the types of Multi-clause Syntax produced by the children and the predictor variables are considered. Consistent with other test results, multiple regression analyses show that, relative to instances of Multi-clause Syntax, later born children produce more coordinate syntax than first born children [Proportion of Multi-clause Syntax which is Coordinate: $B = -.12$, $p = .031$]. Although, at first glance, this might suggest a relative immaturity in later born children in comparison to first born children, further investigation shows that the opposite is the case. Later born children do produce more coordinate syntax [Number of Instances of Coordinate Syntax: $B = -4.28$, $p = .009$] than first born children, however, they also produce more complex syntax [Number of Instances of Complex Syntax: $B = -4.34$, $p = .037$] than first born children. This is true even when story length is taken into account [Ratio of Coordinate Syntax to Propositions: $B = -.07$, $p = .008$; Ratio of Complex Syntax to Utterances: $B = -.12$, $p = .019$; Ratio of Complex Syntax to Propositions: $B = -.06$, p approaches significance at $.078$]. Finally, Total Instances of Multi-clause Syntax is, also greater for later born children than first born children [$B = -8.62$, $p = .005$], even when story length is controlled for [Ratio of Total Multi-Clause Syntax to Propositions: $B = -.13$, $p = .006$].

Also interesting to note here is that girls may have an advantage over boys in this language domain. Along with Age and Birth Order, Gender is another significant positive predictor of Number of Instances of Complex Syntax [$B = 4.68$, $p = .043$]. Gender also approaches significance as a predictor of Ratio of Complex Syntax to Propositions [$B = .07$, $p = .069$] and Ratio of Complex Syntax to Utterances [$B = .10$, $p = .059$]. Consistent with other test results, Maternal Education approaches significance as a predictor of MLTU in Words [$B = .56$, $p = .096$] and Diversity of Complex Syntax [$B = 1.49$, $p = .093$]. Finally, when other variables are taken into account in multiple linear regression analyses, no pattern is evident in relationships between Multi-clause Syntax measures and Irish Input.

Chapter 5 Results

Table 31. Multiple regression coefficients for the prediction of Multi-clause Syntax measures.

<i>Multi-clause Syntax measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
MLTU in Words	3.83** (.008)	0.382	3.53** (.000)	.04** (.003) [+] Std. B: .48	.04 (.953) [+] Std. B: .010	-.47* (.078) [+] Std. B: -.28	.29 (.313) [+] Std. B: .17	.56* (.096) [+] Std. B: .30
MLU in Words	4.07** (.006)	0.396	3.76** (.016)	.07** (.003) [+] Std. B: .47	-.65 (.589) [+] Std. B: -.09	-1.52** (.005) [+] Std. B: -.46	.65 (.253) [+] Std. B: .19	.77 (.240) [+] Std. B: .20
Total Instances of Multi-clause Syntax	3.38** (.015)	0.353	5.29 (.533)	.38** (.005) [+] Std. B: .46	-4.22 (.538) [+] Std. B: -.10	-8.62** (.005) [+] Std. B: -.47	4.71 (.147) [+] Std. B: .25	2.11 (.564) [+] Std. B: .10
Proportion of Multi-clause Syntax which is Coordinate	2.41* (.059)	0.28	.35 (.034)	.00 (.866) [-] Std. B: .03	-.08 (.543) [-] Std. B: -.11	-.12** (.031) [?] Std. B: -.37	-.08 (.223) [?] Std. B: -.22	.06 (.364) [-] Std. B: .17
Ratio of Total Multi-clause Syntax to Propositions	2.53** (.049)	0.29	.22** (.083)	.00 (.058) [+] Std. B: .31	-.06 (.568) [+] Std. B: -.10	-.13** (.006) [+] Std. B: -.48	.06 (.242) [+] Std. B: .21	.05 (.334) [+] Std. B: .18
Number of Instances of Coordinate Syntax	2.64** (.042)	0.299	4.19 (.361)	.13* (.068) [?] Std. B: .30	4.41 (.235) [?] Std. B: -.21	-4.28** (.009) [?] Std. B: -.45	-.03 (.985) [?] Std. B: .00	.99 (.614) [?] Std. B: .09

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

Chapter 5 Results

Table 31 continued. Multiple regression coefficients for the prediction of Multi-clause Syntax measures.

<i>Multi-clause Syntax measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
Ratio of Coordinate Syntax to Propositions	2.49* (.052)	0.287	.12 (.116)	.00 (.258) [?] Std. B: .18	-.07 (.257) [?] Std. B: -.20	-.07** (.008) [?] Std. B: -.47	-.01 (.802) [?] Std. B: -.05	.02 (.438) [?] Std. B: .15
Number of Instances of Complex Syntax	2.66** (.041)	0.3	1.10 (.853)	.25** (.008) [+] Std. B: .45	.20 (.967) [+] Std. B: .01	-4.34** (.037) [+] Std. B: -.35	4.68** (.043) [+] Std. B: .37	1.11 (.662) [+] Std. B: .08
Ratio of Complex Syntax to Propositions	1.57 (.197)	0.202	.11 (.233)	.00* (.091) [+] Std. B: .29	.00 (.954) [+] Std. B: .01	-.06* (.078) [+] Std. B: -.31	.07* (.069) [+] Std. B: .35	.03 (.427) [+] Std. B: .16
Ratio of Complex Syntax to Utterances	2.71** (.038)	0.304	.05 (.736)	.01** (.015) [+] Std. B: .40	.01 (.921) [+] Std. B: .02	-.12** (.019) [+] Std. B: -.40	.10* (.059) [+] Std. B: .34	.05 (.454) [+] Std. B: .14
Diversity of Complex Syntax Types	.99 (.441)	0.137	3.82* (.065)	.03 (.352) [+] Std. B: .17	-.65 (.352) [+] Std. B: -.08	-.30 (.658) [+] Std. B: -.08	1.09 (.159) [+] Std. B: .28	1.49* (.093) [+] Std. B: .35

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

5.4.4 Multi-Clause Syntax: summary

In summary, Birth Order and Age are found to play significant roles in the children's performance in Multi-clause Syntax measures across all three sets of tests, with older and later born children out-performing younger and first born children respectively.

The Spearman's rho non-parametric correlation test (see Table 29) reveals relationships between Irish Input and some measures of Multi-clause Syntax suggesting that the higher the child's Proportion Irish Input since Birth the more likely the child is to produce a high frequency of Multi-clause Syntax. However, these relationships are neither picked up in the non-parametric distribution and trend tests (see Table 30a) nor in the parametric correlation (see Table 29) and multiple linear regression analyses (see Table 31). A non-linear relationship, if present, may have been missed by distribution and trend tests because continuous Irish Input data were dichotomised for these tests resulting in significant relationships with Multi-clause Syntax measures being less easily identifiable. However, evidence for this is weak.

Gender and Maternal Education also play significant and near significant roles in the children's performance on particular measures of Multi-clause Syntax indicating the expected advantage of girls over boys and high Maternal Education over low (see Tables 29, 30a, 31).

As previously stated, the most useful measures of Multi-clause Syntax in terms of established statistical interdependencies: MLU in Words, MLTU in Words, Total Instances of Multi-clause Syntax, Ratio of Complex Syntax to Utterances, Number of Instances of Complex Syntax, are identified by relatively high R Square coefficients in results of multiple regression analyses (see Table 31). This evidence of established statistical interdependence is corroborated by evidence across the other tests. The identification of five measures as the most useful is supported by the combined evidence of strength of relationships with Age and of frequency

of significant relationships with independent measures across correlation, distribution and trend tests (see Tables 29, 30 and 30a). These five measures have the strongest relationships with Age. Also, they have significant relationships with the greatest number of independent variables (two each, usually Age and Birth Order). Others mostly have significant relationships with one measure or less. The single exception to this is Proportion Multi-clause Syntax which is Coordinate which has a significant relationship with both Birth Order and Gender in correlation (Table 29) and distribution and trend tests (Table 30a). However, its relationship with Age is insignificant and very weak relative to the five measures identified by relatively high R Square coefficients in multiple regression analyses (see Table 31).

Taking these findings together, Multi-clause Syntax measures such as MLU in Words, MLTU in Words, Total Instances of Multi-clause Syntax, Ratio of Complex Syntax to Utterances and Number of Instances of Complex Syntax present as useful ways of capturing language proficiency in the population examined.

5.5 Verb Vocabulary

5.5.1 Verb Vocabulary: correlation tests

Table 32 presents parametric and non-parametric bivariate correlations for Verb Vocabulary measures and five independent variables: Age, Irish Input, Birth Order, Gender and Maternal Education.

The main finding presented in this table is that Verb Vocabulary increases with Age. The verb vocabulary measure, Number of Verb Types, is found to have a significant positive relationship with Age across both correlation tests. An attempt to take story length into account results in this relationship becoming negative and insignificant across both tests (Age and Ratio of Verb Types to Propositions: $r = -.22$, $p = .178$; $P = -.16$, $p = .331$). This suggests that, similar to the findings in the literature with regard to type/token ratios (Richards and Malvern, 1998; Malvern and Richards, 2000), as children get older and produce longer stories, Number of Verb Types does not keep pace sufficiently with Number of Propositions resulting in a decrease in the ratio score. Nevertheless, Number of Verb Types and Number of Propositions correlate relatively strongly with each other [$r = .72$, $p = .000$, $P = .75$, $p = .000$]. It was considered possible that the significant positive relationship found between Age and Number of Verb Types may be mostly a consequence of the significant positive relationship evident between Age and Number of Propositions [$r = .37$, $p = .021$; $P = .43$, $p = .007$] rather than evidence of a direct relationship between Verb Vocabulary and Age. This possibility lead to further investigation of relationships between these measures. When the Number of Propositions is controlled for in a partial correlation, Number of Verb Types and Age actually still correlate, albeit to a lesser degree [$r = .33$, $p = .044$]. In fact, when Number of Verb Types is controlled for, Age and Number of Propositions no longer correlate [$r = .04$, $p = .811$]. So, it appears that Age and Number of Propositions are related indirectly via at least one other variable: Number of Verb Types and that, despite concerns to the contrary, Age and Number of Verb Types do indeed have a direct relationship.

The second most important finding presented in this table is that Irish Input may have a positive relationship with Verb Vocabulary. Positive correlations between Irish Input and Number of Verb Types approach significance only when Pearson's r is conducted [$r = .27$, $p = .098$; $P = .26$, $p = .107$]. Similar to the relationship found with Age, when story length is controlled for using the measure Ratio of Verb Types to Propositions these p values increase bringing this relationship further from significance [$r = .21$, $p = .208$; $P = .13$, $p = .428$]. Unlike in the case of Age, the near significant relationship between Irish Input and Number of Verb Types is not suspected to be an indirect relationship mediated by Number of Propositions because Irish Input and Number of Propositions are far from significantly correlated [$r = .05$, $p = .79$; $P = .05$, $p = .78$].

Finally, neither Birth Order, Gender nor Maternal Education have significant or near significant relationships with Verb Vocabulary measures. Relationship directions, although insignificant, are consistent with those found with other language measures suggesting a possible advantage in Number of Verb Types for later born children, girls and children whose mothers have higher levels of Education.

Chapter 5 Results

Table 32. Bivariate correlations for Verb Vocabulary measures and five independent measures.

<i>Verb Vocabulary measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Number of Verb Types	.48** (.002)	.27* (.098)	-.11 (.511)	.12 (.456)	.16 (.340)	.50** (.001)	.26 (.107)	-.05 (.759)	.20 (.227)	.10 (.544)
Ratio of Verb Types to Propositions	-.22 (.178)	.21 (.208)	.23 (.154)	-.06 (.733)	.19 (.254)	-.16 (.331)	.13 (.428)	.21 (.207)	-.15 (.371)	.23 (.175)

Note: ** p<.05; * p between .05 and .99.

5.5.2 Verb Vocabulary: distribution and trend tests

In Tables 33 and 33a, the results of distribution and trend tests on Verb Vocabulary measures across levels of the five independent variables: Age, Irish Input, Birth Order, Gender and Maternal Education are presented.

The main finding from these tables is, again, that Number of Verb Types increases with Age. A Kruskal-Wallis test reveals significant effects of age group (three groups: three year olds, four year olds and five and six year olds) on Number of Verb Types [KW = 9.77, $p = .008$]. A Jonckheere trend test reveals a significant positive trend across the age groups [$J = 3.23$, $p = .001$]. These results indicate that the Number of Verb Types increases as children get older. However, in line with previous tests, when an attempt is made to take story length into account, no effect of age group is found [Ratio of Verb Types to Propositions: KW = 3.01, $p = .222$; $J = -.980$, $p = .327$]. This finding holds true even when the data is only tested for a change between younger (three and four year old) and older (five and six year old) children [Ratio of Verb Types to Propositions: KW = 2.50, $p = .114$; $J = -1.58$, $p = .114$] or for a change between the youngest children (three year olds) and the rest (four, five and six year olds) [KW = .01, $p = .905$; $J = -.12$, $p = .905$].

The second most important finding is that Verb Vocabulary measures increase with Irish Input. A Kruskal Wallis test with Irish Input as the grouping variable and Number of Verb Types as the test variable reveals a positive effect of Irish Input [KW = 4.31, $p = .038$, $J = 2.08$, $p = .038$]. Further, when an attempt is made to control for story length, an Irish Input effect is still evident [Ratio of Verb Types to Propositions: KW = 4.20, $p = .04$, $J = 2.05$, $p = .04$].

Finally, significant effects of neither Birth Order, Gender nor Maternal Education are evident in distributions of Verb Vocabulary measures. Relationship directions, although insignificant, are again consistent with those found with other language measures, again suggesting a possible

advantage for later born children, girls and children with higher Maternal Education in Number of Verb Types. However, in order to control for other independent variables and their possible relationships with Verb Vocabulary measures, multiple regression analyses are carried out.

Chapter 5 Results

Table 33. Kruskal Wallis and Jonckheere trend statistics for Vocabulary measures across Age groups.

<i>Voabulary measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years.		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Number of Verb Types	9.77** (.008)	3.23** (.001)	7.14** (.008)	2.67** (.008)	.72** (.007)	.27** (.007)
Ratio of Verb Types to Propositions	3.01 (.222)	-.98 (.327)	2.50 (.114)	-1.58 (.114)	.01 (.905)	-.12 (.905)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 33a. Kruskal Wallis and Jonckheere trend statistics for Vocabulary measures across Input, Birth Order, Gender and Maternal Education groups .

	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
<i>Vocabulary measures</i>	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Number of Verb Types	4.31** (.038)	2.08** (.038)	.10 (.755)	-.31 (.755)	1.49 (.223)	1.22 (.223)	.38 (.537)	.62 (.537)
Ratio of Verb Types to Propositions	4.20** (.040)	2.05** (.040)	1.62 (.202)	1.27 (.202)	.82 (.364)	-.91 (.364)	1.87 (.171)	1.37 (.171)

Note: ** p<.05; * p between .05 and .99

5.5.3 Verb Vocabulary: multiple regression analyses

Table 34 presents the results of multiple regression analyses with Verb Vocabulary measures as outcome variables and Age, Irish Input, Birth Order, Gender and Maternal Education as predictor variables.

The main finding presented in Table 34 is that the combination of these five predictor variables emerges as a significant explanatory model for Number of Verb Types indicating its usefulness as a measure of language development. Using the same method and predictor variables, a significant explanatory model does not emerge for the Verb vocabulary measure when controlled for story length: Ratio of Verb Types to Propositions: [$F = 1.609$, $p = .187$, $R \text{ square} = .206$]. Birth Order may be found to have a relationship with Ratio of Verb Types to Propositions if sample size is increased [$B = .01$, $p = .079$]. This relationship is very weak and, as the effect of Birth Order on Number of Verb Types is insignificant and negative, may be simply due to the tendency of first born children to produce slightly less propositions than later born children.

Another important finding evident in this table is that Age emerges as a useful predictor of Verb Vocabulary development, it being the only significant predictor of Number of Verb Types in this model [$B = .23$, $p = .002$]. In further investigation of the relationship between Number of Verb Types and Age, a multiple regression analysis with Number of Verb Types as the outcome variable and Number of Propositions and Age as the predictor variables reveals both to be significant predictors, the former being slightly stronger [Number of Propositions: $B = .22$, $p = .000$; Age: $B = .11$, $p = .044$; Variance inflation factor (V.I.F.) = 1.157 indicating no multicollinearity]. It is clear, then, that the Number of Verb Types does increase with Age although this relationship is not quite as strong as it first appears in simple correlation test results which do not control for other variables..

Finally, despite somewhat encouraging correlation and distribution test results, when other variables are controlled for, Irish Input neither nears nor reaches significance as a predictor variable for Verb Vocabulary measures. Nevertheless, the directions of relationships with Number of Verb Types are consistent with those found in other tests: showing a possible increase with Irish Input, Birth Order and Maternal Education and a possible advantage for girls over boys.

Chapter 5 Results

Table 34. Multiple regression coefficients for the prediction of Verb Vocabulary measures.

<i>Verb Vocabulary measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
Number of Verb Types	2.94** (.028)	0.322	7.91* (.099)	.23** (.002) [+] Std. B: .51	4.05 (.289) [+] Std. B: .18	-1.21 (.447) [+] Std. B: -.12	2.77 (.124) [+] Std. B: .27	.75 (.709) [+] Std. B: .07
Ratio of Verb Types to Propositions	1.61 (.187)	0.206	.09** (.000)	.00 (.101) [?] Std. B: -.28	.02 (.196) [?] Std. B: .24	.01* (.079) [?] Std. B: .31	-.01 (.413) [?] Std. B: -.16	.00 (.582) [?] Std. B: .11

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

5.5.4 Verb Vocabulary: summary

In summary, Verb Vocabulary tends to increase with Age and it may also increase with Irish Input. Other independent variables generally have insignificant relationships with Verb Vocabulary measures. These relationships are nevertheless consistent in direction across tests and corroborate with relationships between independent variables and measures in the language domains of Productivity and Multi-clause Syntax.

As previously stated, the more useful measure of Verb Vocabulary in terms of established statistical interdependencies: Number of Verb Types is identified by relatively high R Square coefficients in results of multiple regression analyses. Supporting evidence for the identification of this measure is found across correlation (Table 32), distribution and trend tests (Table 33). Across these tests, Number of Verb Types has a significant positive relationship with Age. In distribution and trend tests: this measure has a significant relationship with both Age and Irish Input whereas the other measure, Ratio of Verb Types to Propositions, only has a significant relationship with Irish Input.

Taking these findings together, the Verb Vocabulary measure Number of Verb Types presents as a useful way of capturing language proficiency in the population examined.

5.6 Grammatical Accuracy

Preliminary preparation unique to the language domain of Grammatical Accuracy was necessary. This took the form of investigation of the grammatical quality of parents' language and identified the subset of Grammatical Accuracy measures on which parents were found to be consistent. Then, as in other language domains, the five complementary tests were used to investigate this subset of measures of Grammatical

Accuracy in children’s stories and their relationships with independent variables.

Thirty-one main measures of grammatical accuracy were calculated for both parents’ and children’s stories. All these main measures are described and justified in Tables 19 and 20 and their related text in the *Methodology* chapter. Parents’ performance is inconsistent in five of these main measures and consistent in the remaining twenty-six.

Figures 5 and 6, below, present examples of parents’ inconsistent performance. Figures 7 and 8 present examples of parents’ consistent performance. The corresponding performance of children on these measures are presented in Figures 5a, 6a, 7a and 8a.

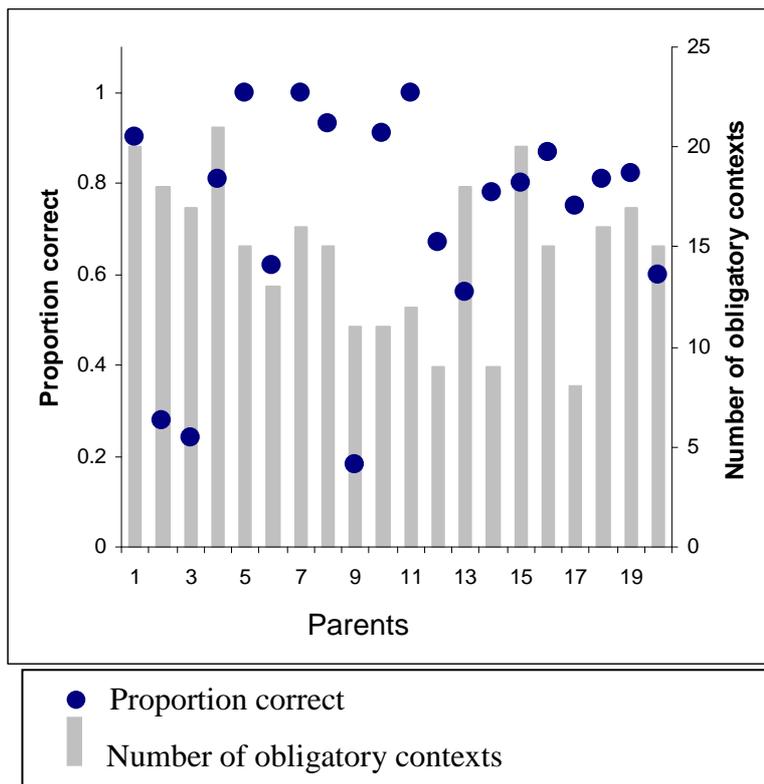


Figure 5. Graph of an example of parents’ inconsistent performance. Total prepositional case inflection of nouns following the article.

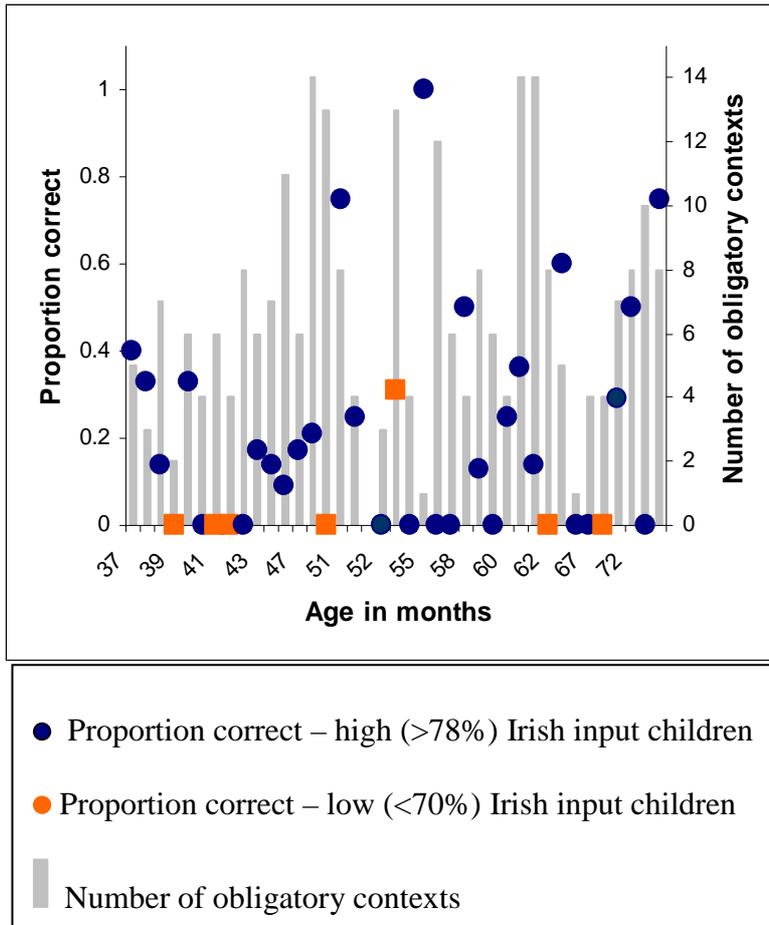


Figure 5a Graph of children’s performance on Total prepositional case inflection of nouns following the article.

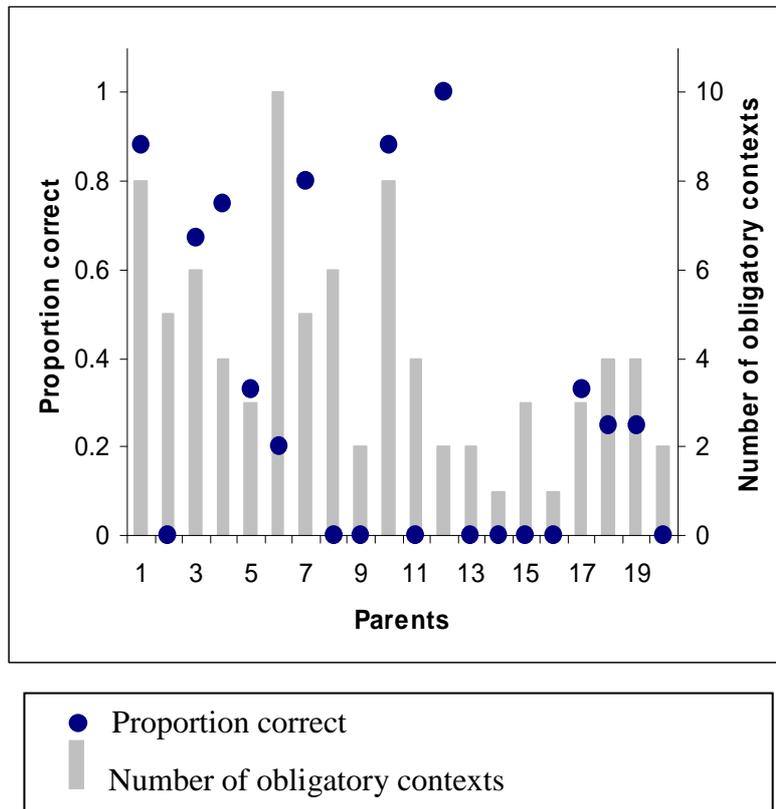


Figure 6 Graph of an example of parents’ inconsistent performance. Total genitive case inflection of nouns.⁸

⁸ Note: four parents showed full consistency on this measure when contexts including borrowed words were excluded.

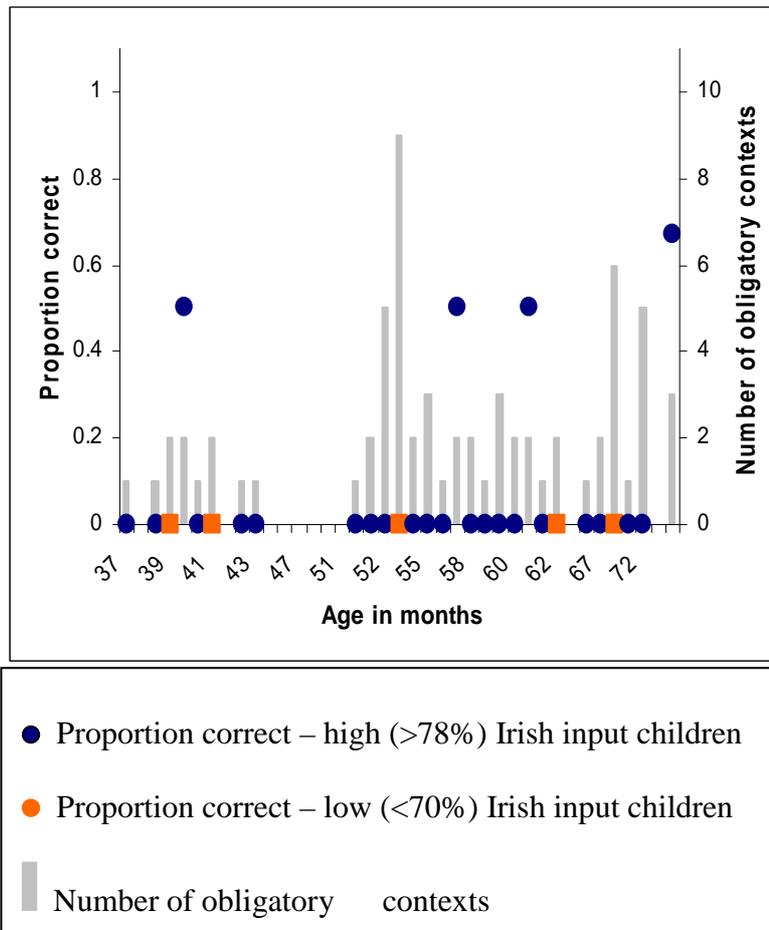


Figure 6a. Graph of children’s performance on Total genitive case inflection of nouns.⁹

⁹ Note: almost all genitives in the sample are definite.

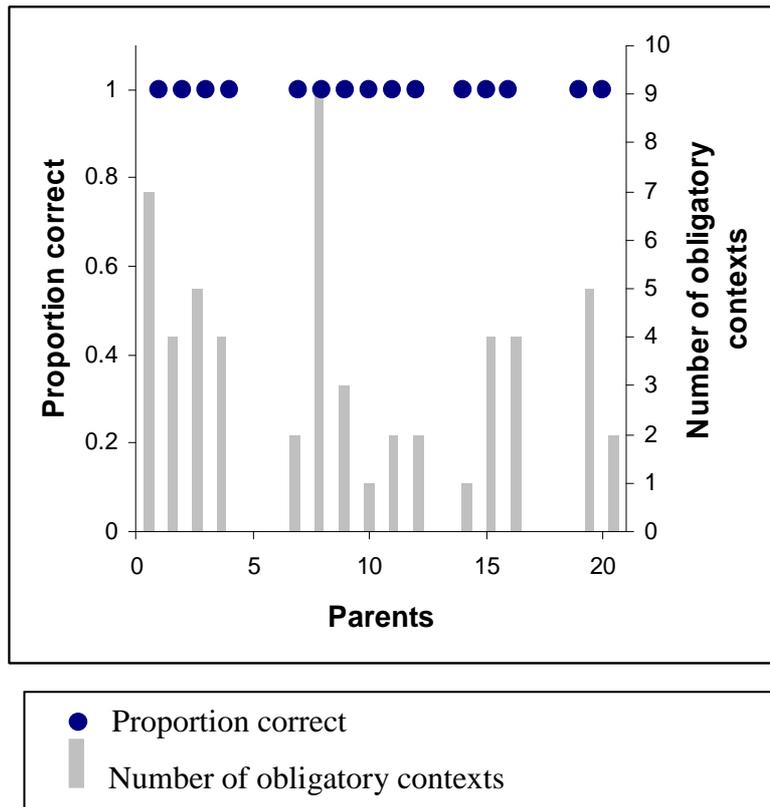


Figure 7. Graph of an example of parents' consistent performance. Parents' proclitic d' marking of past tense: proportion correct use in obligatory contexts.

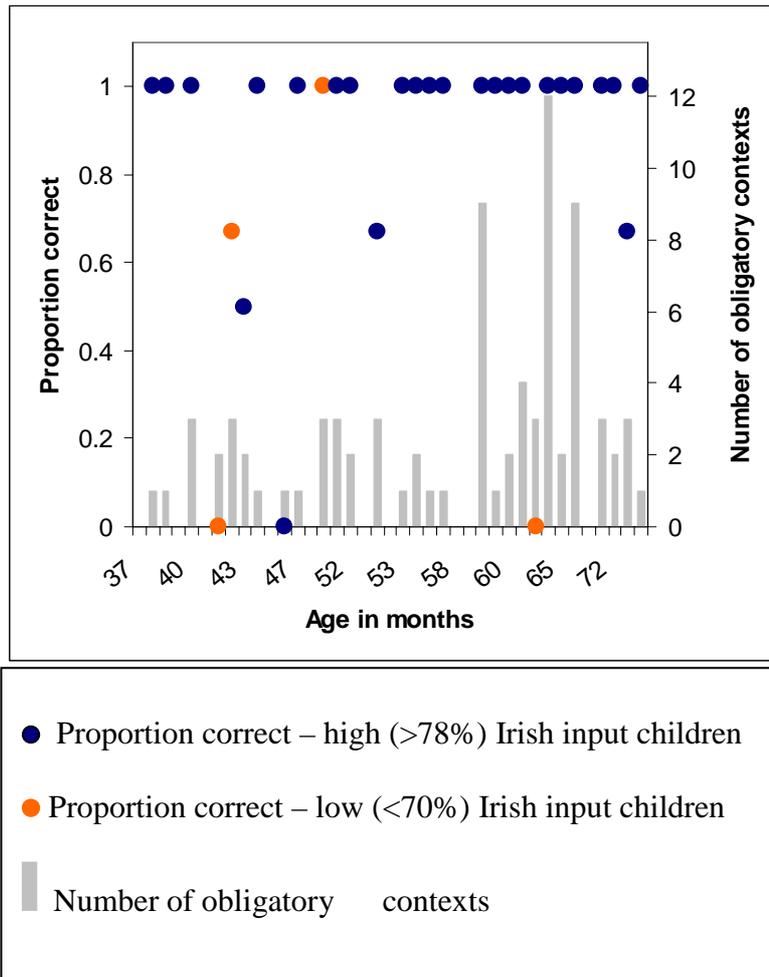


Figure 7a . Graph of children’s proclitic d’ marking of past tense: proportion correct use in obligatory contexts.

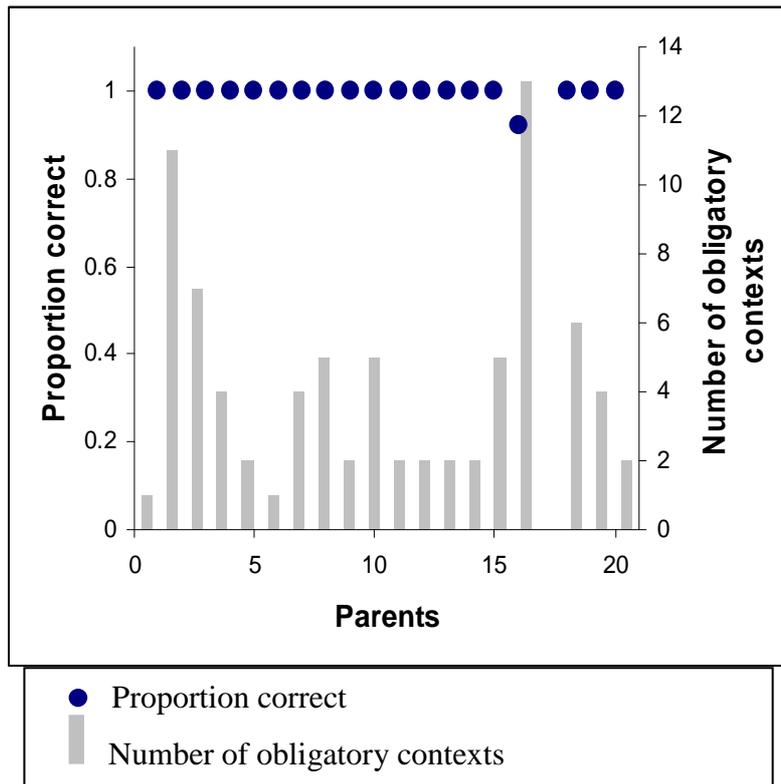
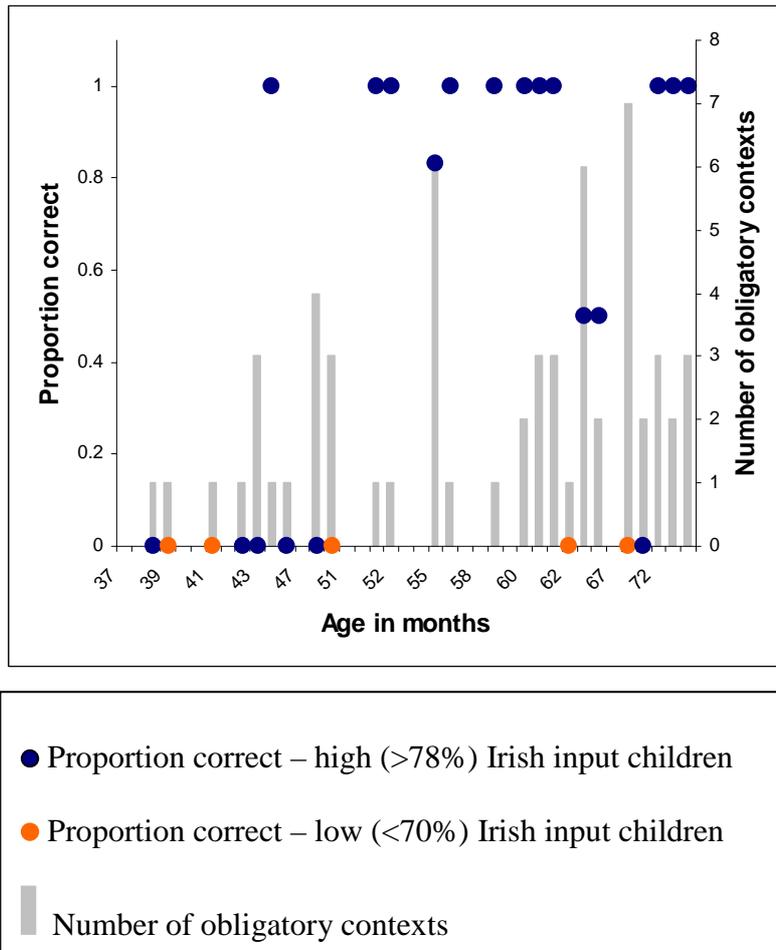


Figure 8. Graph of an example of parents' consistent performance. Special word order: proportion correct use in obligatory contexts.



by inconsistency, children can neither schematise nor analogise sufficiently and therefore remain at the lexical or ‘frozen phrase’ (Ambridge & Lieven, p.126) stage of acquiring grammatical constructions. For example, no patterns according to Age or quantity of Irish Input are evident in Figures 5a and 6a.

5.6.1 Investigating the possibility that parent inconsistency is due to poor measure design.

Before excluding these Grammatical Accuracy measures from further analysis it was deemed necessary to investigate the possibility that poor measure design gave the impression of more inconsistency than was in fact present i.e. inconsistency in parents’ performance on these measures may have been due to the incorporation of too many subtypes and variations into main measures. If this was the case, any consistency in parent performance in these subtypes and variations may have been hidden from view. It was, therefore, thought possible that parents’ performance could have been inconsistent on these main measures and yet consistent on some subtypes and variations of these main measures.

It was hypothesised that when, subtypes were separated out, for example, when words borrowed from English were excluded or when the inflection effect of particular prepositions and article combinations on nouns e.g. *sa* (‘in the’) were considered by themselves, parents’ performance would become consistent. The reasoning behind these hypotheses was as follows: English words are usually borrowed in their uninflected form and remain unintegrated and therefore would not behave similarly to their Irish counterparts. The inflection in ‘sa’ (a preposition and article combined) may be more available for lexical learning than the inflection effect on the noun following a ‘preposition + article’ which remain separate. Parents’ performance on these variations and subtypes of main measures and on twenty other measures was investigated. The results of these investigations should be interpreted with caution as obligatory contexts for some of these measures are quite few. Examples of parents’ performance on these

subtypes and variations are provided below in Figures 9-12. From inspection of the graphs, it seems that inconsistency, although sometimes reduced, remains present in parents' performance on subtypes and variations of the inconsistent main measures. For example, even when English words were excluded (Figure 9, Prepositional case inflection of native Irish nouns following the article) significant inconsistency remained in parents' language. It follows that no relationship between age and grammatical accuracy in children should be hypothesised for these subtype and variation measures either. Indeed, children's performance on these main measures, subtypes and variations is found to be inconsistent at all ages included in the study. Examples of child performance on these subtypes and variations are also provided below (Figures 9a, 10a, 11a and 12a).

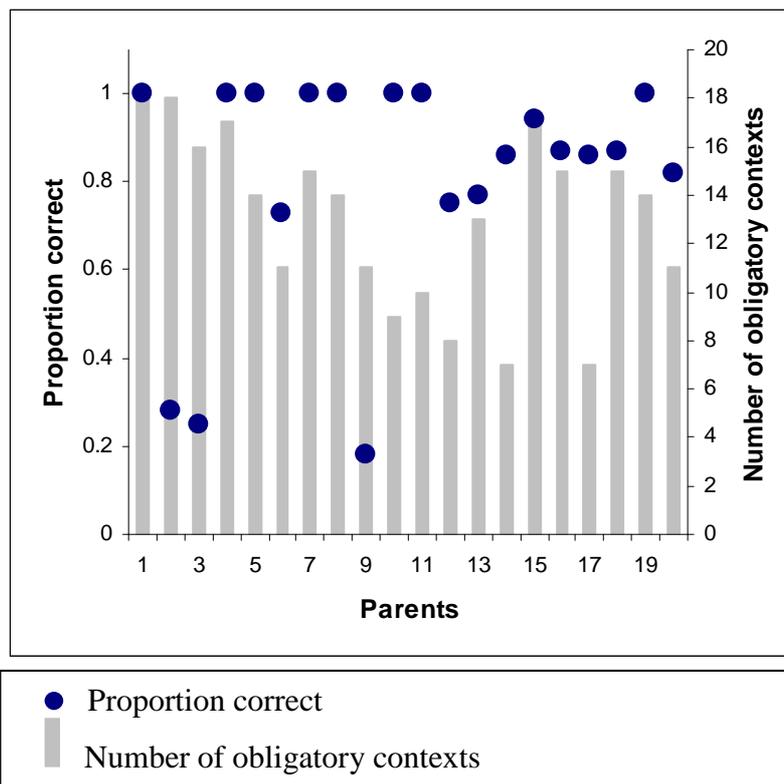
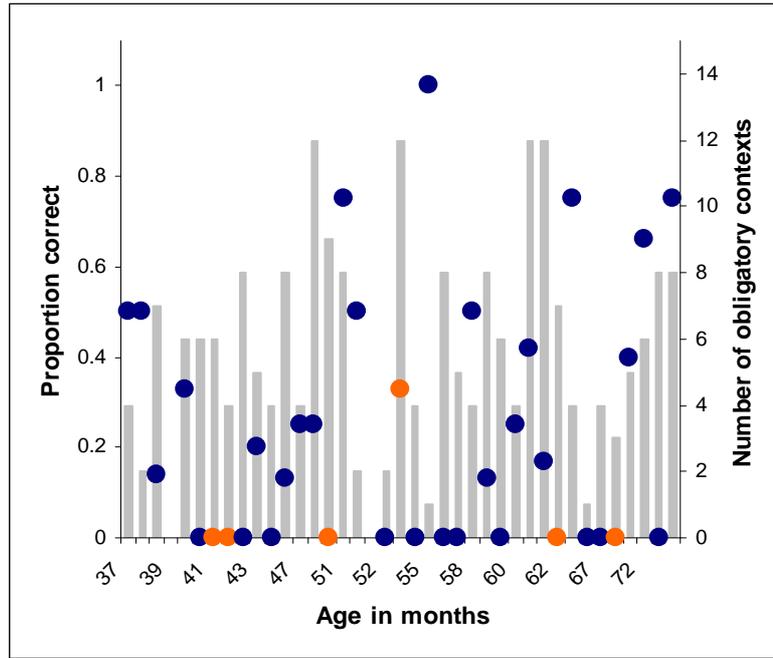


Figure 9. Graph of an example of parents' inconsistent performance on subtypes and variations of inconsistent main measures. Prepositional case inflection of native Irish nouns following the article.



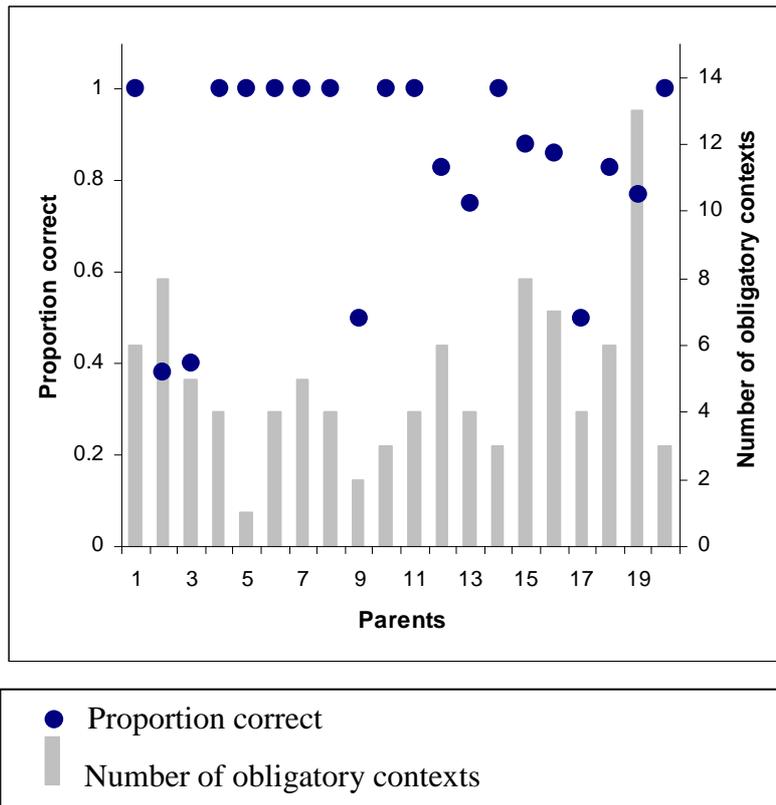


Figure 10. Graph of an example of parents inconsistent performance on subtypes and variations of inconsistent main measures. *sa + eclipsis*

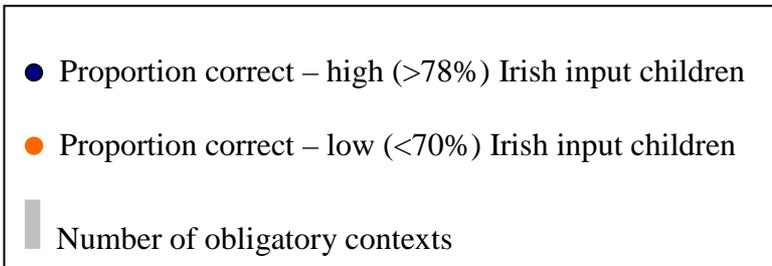
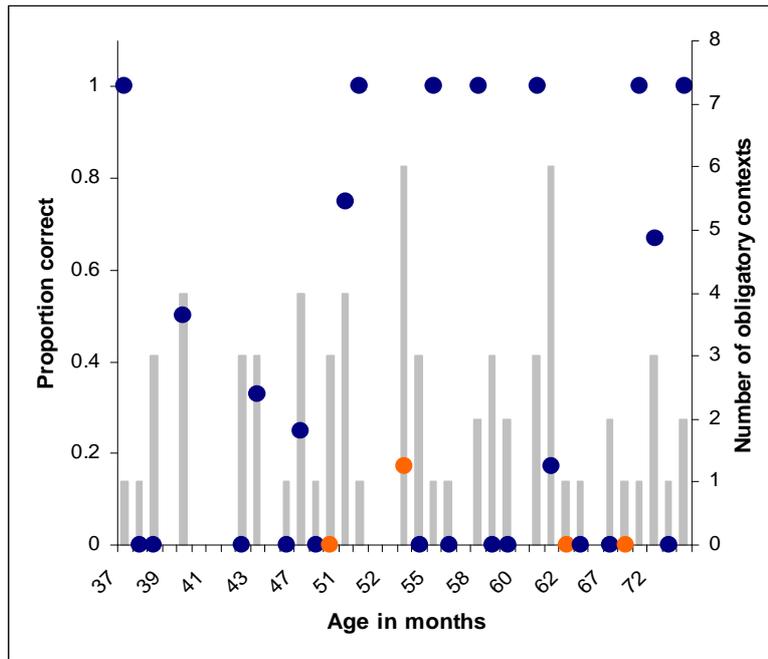


Figure 10a. Graph of children’s performance on *sa* + eclipsis.

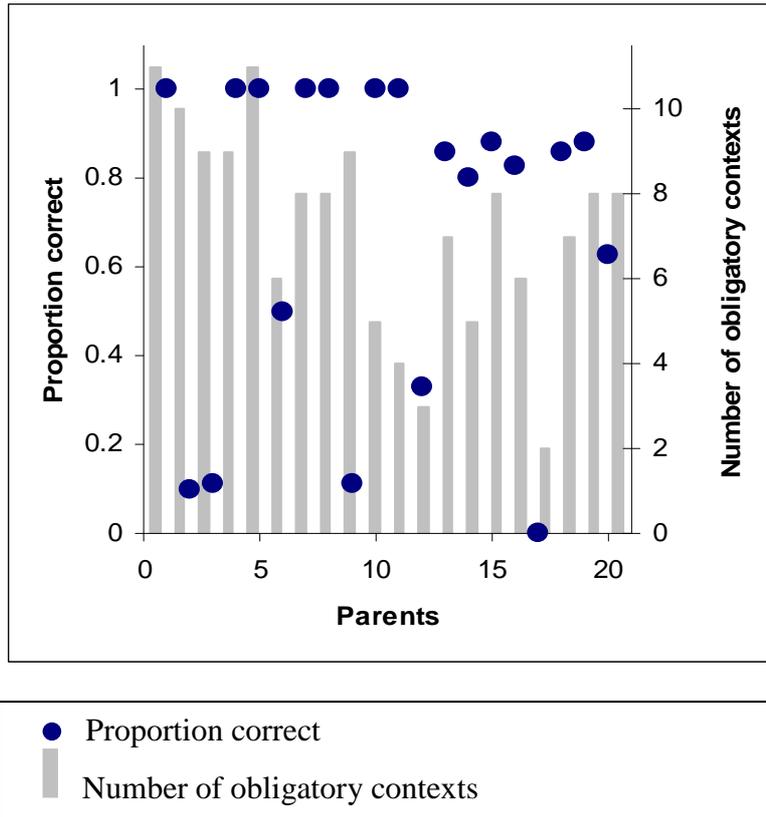


Figure 11. Graph of an example of parents’ inconsistent performance on subtypes and variations of inconsistent main measures. Prepositional case inflection of nouns following the article (Type B)

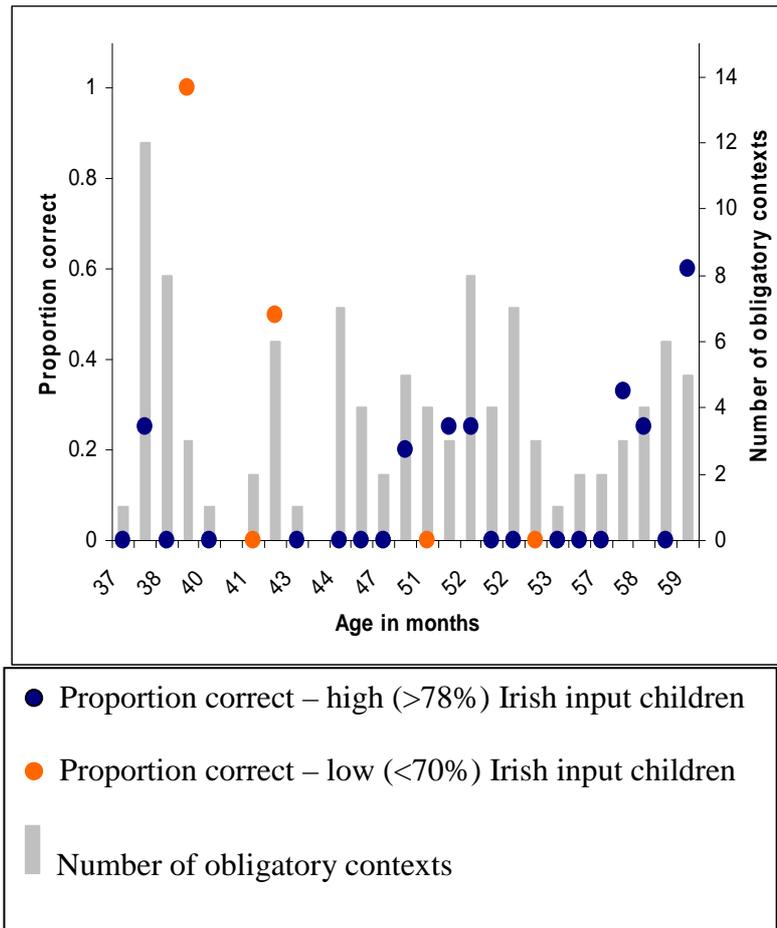


Figure 11a. Graph of children’s performance on Prepositional case inflection of nouns following the article (Type B)

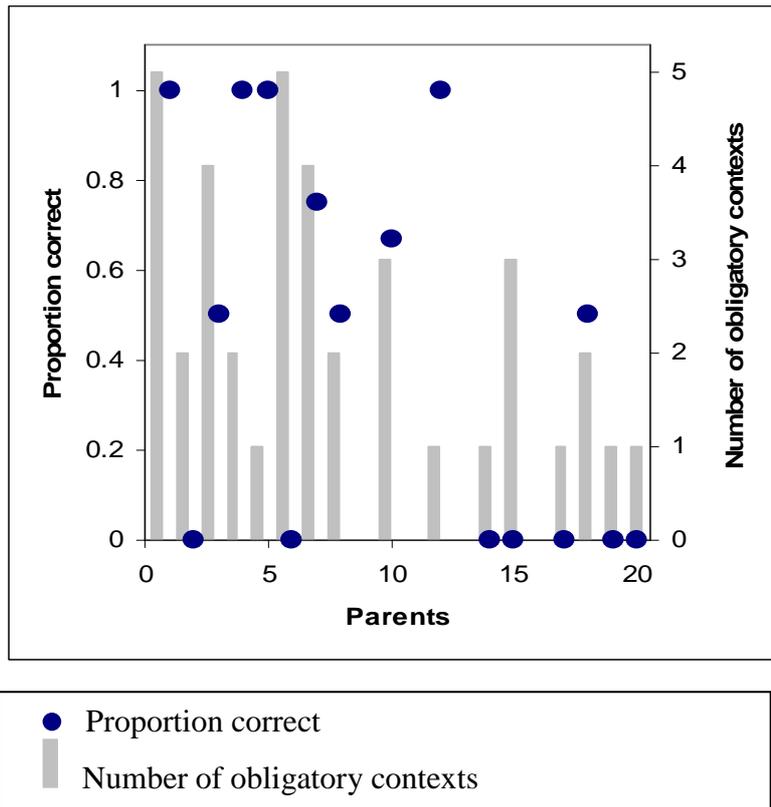


Figure 12. Graph of an example of parents' inconsistent performance on subtypes and variations of inconsistent main measures. Initial mutation marking genitive case.

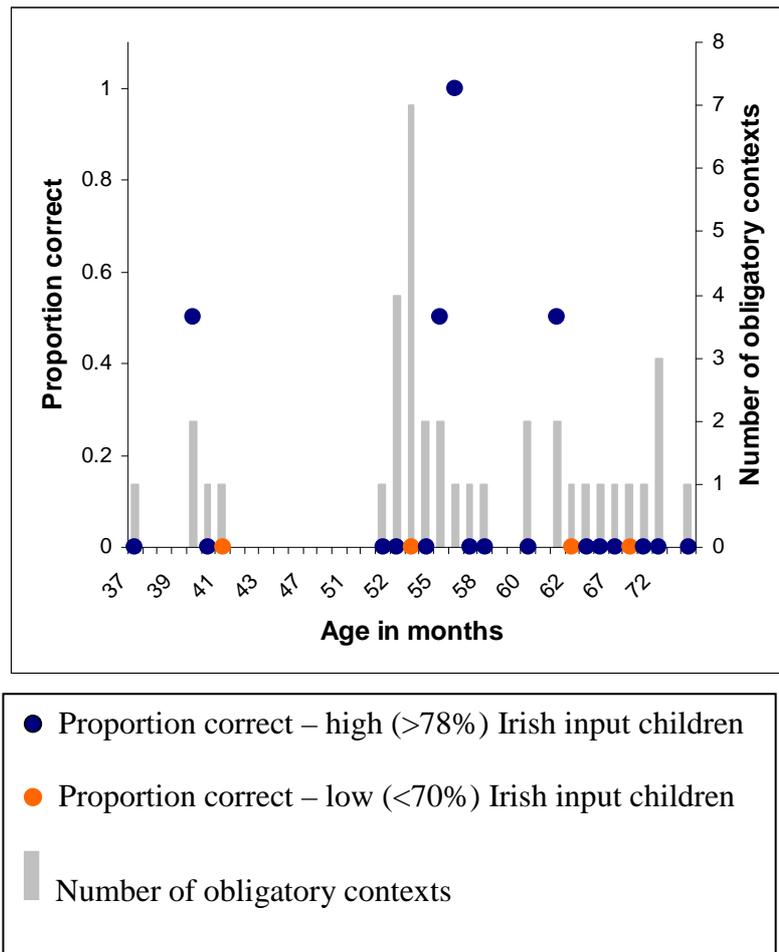


Figure 12a. Graph of children's performance on initial mutation marking of genitive case.

When parents' stories include obligatory contexts for the remaining twenty-six main Grammatical Accuracy measures they consistently produce them in the traditional manner. Figures 7 and 8 present examples of such consistent performance. Parents' performances on twenty-four other Grammatical Accuracy measures are similarly consistent. Children's performance on the twenty-six grammatical accuracy measures on which parents are found to be consistent were hypothesised to be related to the independent variables: Age, Irish Input, Birth Order, Gender, Maternal Education. Patterns according to Age and Irish Input are evident in Figures 7a and 8a.

These twenty-six main measures which are consistent across parents are investigated in children's stories, as with measures in other language domains, for relationships with the five independent variables. Thirty-nine

children's stories were analysed in this study however only twenty-nine and twenty-five of these children are represented by dots and grey bars on graphs c1 and d1 respectively. This is because some children's stories do not include any obligatory contexts for some of eighteen out of these twenty-six measures. These eighteen measures are recalculated with an absence of obligatory contexts for a particular measure in a child's story treated the same as zero accuracy for that measure. These new measures are labelled by appending '(No O.C.s = Zero Accuracy)' to the names of measures from which they are derived. These new measures are then investigated for relationships with independent variables. Therefore, a total of forty-four Grammatical Accuracy measures are investigated for these relationships.

Chapter 5 Results

Table 33 continued. Bivariate correlations for Grammatical Accuracy measures and five independent measures.

<i>Grammatical Accuracy Measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Pseudo-cleft Constructions	.50* (.081)	.46 (.110)	-.11 (.733)	-.20 (.505)	-.04 (.906)	.40 (.172)	.36 (.224)	-.07 (.831)	-.26 (.389)	-.09 (.780)
Pseudo-cleft Constructions (No O.C.s = Zero accuracy)	.12 (.475)	.23 (.155)	-.01 (.959)	-.01 (.954)	.01 (.945)	.16 (.325)	.34** (.033)	-.03 (.870)	.03 (.836)	.04 (.823)
Preverbal Particles	-.21 (.212)	-.18 (.290)	.24 (.146)	.17 (.324)	-.20 (.247)	-.26 (.121)	-.25 (.141)	.22 (.198)	.07 (.681)	-.18 (.315)
Preverbal Particles (No O.C.s = Zero accuracy)	-.22 (.171)	-.08 (.613)	.05 (.747)	.12 (.468)	-.20 (.226)	-.28* (.079)	-.14 (.402)	.17 (.308)	.09 (.574)	-.22 (.184)
Adjective Agreement with Plural Nouns	-.08 (.721)	.23 (.294)	.01 (.976)	-.24 (.284)	.14 (.554)	-.09 (.704)	.02 (.925)	.05 (.810)	-.22 (.323)	.13 (.580)
Adjective Agreement with Plural Nouns (No O.C.s = Zero accuracy)	.03 (.878)	.16 (.338)	-.13 (.446)	-.21 (.203)	.13 (.454)	.01 (.952)	.07 (.685)	-.14 (.396)	-.24 (.149)	.10 (.542)
'ag' preceding Verbal Nouns	.13 (.426)	.07 (.661)	.04 (.802)	-.30* (.068)	.24 (.159)	.05 (.762)	.03 (.852)	.10 (.547)	-.29* (.077)	.29* (.085)
Article Agreement with Plural Nominative Case Nouns	-.14 (.422)	.39** (.019)	.21 (.221)	.02 (.906)	.42** (.012)	-.23 (.180)	.18 (.302)	.08 (.629)	.03 (.850)	.40** (.018)
Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero accuracy)	.00 (.988)	.43** (.007)	.09 (.610)	-.05 (.777)	.42** (.010)	-.07 (.673)	.23 (.158)	-.02 (.926)	-.04 (.836)	.40** (.015)

Note: ** p<.05; * p between .05 and .99.

5.6.2 Grammatical Accuracy: correlation tests

Table 35 presents parametric and non-parametric bivariate correlations for 44 Grammatical Accuracy measures and five independent variables: Age, Irish Input, Birth Order, Gender and Maternal Education. As this table is relatively long, a count of significant and near significant relationships which reflect an increase in Grammatical Accuracy with the independent variable (or, in the case of gender, a female advantage in Grammatical Accuracy) is given in Table 35a in order to allow easy comparison across independent variables. Although, based on literature and current theory Grammatical Accuracy was expected to deteriorate with rising Birth Order (i.e. it was expected that first born children would have an advantage over later born children), based on this group of children's performance in other language domains, the opposite seems to be the case. It is for this reason that only significant or near significant relationships which reflect an improvement with Birth Order (or, in other words, an advantage of later born children over first born children) are counted in Table 35a (and also below in Tables 36a, 37a and 38a).

Thirty-six out of forty-four Grammatical Accuracy measures correlate significantly or nearly significantly with at least one independent variable. The main finding presented in Tables 35 and 35a is that, overall, correlation tests reflect improvement in Grammatical Accuracy with Irish Input, Age and Maternal Education.

Relationship directions (significant and insignificant) between Grammatical Accuracy and Irish Input reflect improvement in Grammatical Accuracy with increased Irish Input on two-thirds of Grammatical Accuracy measures. The remaining measures, and therefore a minority, reflect relationships (significant and insignificant) in the opposite direction. Striking also is that eleven Grammatical Accuracy measures have significant / near significant relationships which reflect improvement with Irish Input whereas only one measure of Grammatical Accuracy has a relationship with Irish Input which

nears significance and reflects the opposite: a deterioration in accuracy with rise in Irish Input (Adverbial Complements).

Relationship directions (significant and insignificant) between Grammatical Accuracy and Age reflect improvement in Grammatical Accuracy with Age just over half the time. The remaining measures and therefore a large minority, reflect relationships (significant and insignificant) in the opposite direction. Noteworthy also is that ten measures of Grammatical Accuracy have significant / near significant relationships which reflect improvement with Age whereas only two measures of Grammatical Accuracy have significant / near significant relationships with Age which reflect a deterioration in Accuracy with Age (Simple Prepositions, Adverbial Complements).

Relationship directions (significant and insignificant) between Grammatical Accuracy and Maternal Education reflect improvement in Grammatical Accuracy with Maternal Education over four-fifths of the time. Further, ten measures of Grammatical Accuracy have significant / near significant relationships which reflect improvement with Maternal Education whereas only one measure of Grammatical Accuracy has a significant / near significant relationship with Maternal Education which reflects a deterioration with increasing Maternal Education (Go + eclipsis).

In general, Birth Order and Gender have less certain relationships with less consistent directions with the Grammatical Accuracy language domain. Relationship directions (both significant and insignificant) between Grammatical Accuracy measures and Birth Order reflect improvement in Grammatical Accuracy with increase in Birth Order less than half of the time. Nevertheless, there are five significant / near significant relationships with Birth Order that reflect an improvement in Grammatical Accuracy with rising Birth Order and only one that represents a deterioration with rising Birth Order (San + V (No O.C.s = Zero accuracy)).

Finally, relationship directions (both significant and insignificant) between Grammatical Accuracy measures and Gender reflect an advantage for girls only one-third of the time. Two-thirds of the time, directions suggest an advantage of boys over girls in Grammatical Accuracy. However, disproportionately, two measures of Grammatical Accuracy (Direct Speech (No O.C.s = Zero Accuracy) and Simple Prepositions) have significant / near significant relationships which reflect an advantage of girls over boys and only one ('ag' preceding verbal noun) has a near significant relationship with Gender which reflects the opposite advantage of boys over girls.

Chapter 5 Results

Table 35. Bivariate correlations for Grammatical Accuracy measures and five independent measures.

<i>Grammatical Accuracy Measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Past Tense Lenition	.17 (.305)	.31* (.052)	-.17 (.290)	-.06 (.731)	.27 (.107)	.16 (.331)	.35** (.031)	-.12 (.463)	-.03 (.841)	.13 (.442)
Past Tense Proclitic 'd''	.22 (.244)	.54** (.003)	-.40** (.032)	-.05 (.796)	.04 (.830)	.20 (.294)	.48** (.008)	-.42** (.024)	-.07 (.721)	.04 (.861)
Past Tense Proclitic 'd'' (No O.C.s = Zero accuracy)	.27* (.097)	.37** (.021)	-.08 (.646)	.02 (.928)	.05 (.749)	.27* (.097)	.23 (.164)	-.11 (.489)	.01 (.974)	.05 (.750)
Past Tense Lenition of 'bí'	.23 (.167)	.50** (.001)	-.33** (.041)	-.10 (.545)	.34** (.042)	.16 (.333)	.53** (.000)	-.36** (.025)	-.17 (.311)	.24 (.153)
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a'	.60** (.023)	-.22 (.458)	.35 (.215)	-.30 (.290)	.28 (.325)	.51* (.064)	-.25 (.382)	.35 (.215)	-.30 (.290)	.28 (.325)
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a' (No O.C.s = Zero accuracy)	.46** (.004)	-.07 (.679)	.09 (.602)	-.08 (.628)	.16 (.339)	.47** (.002)	-.09 (.590)	.09 (.602)	-.08 (.628)	.16 (.339)
Eclipsis of Verbs following the Complementiser 'go'	-.48 (.232)	.42 (.305)	.15 (.725)	-.33 (.420)	-.66* (.078)	-.51 (.200)	.44 (.271)	.15 (.725)	-.33 (.420)	-.66* (.078)
Eclipsis of Verbs following the Complementiser 'go' (No O.C.s = Zero accuracy)	-.13 (.420)	.15 (.352)	.03 (.856)	-.07 (.679)	-.12 (.466)	-.13 (.415)	.29* (.074)	.03 (.856)	-.07 (.679)	-.12 (.466)
Future Tense of Verbs	-.02 (.915)	-.14 (.516)	-.48** (.018)	-.24 (.262)	.06 (.792)	-.02 (.922)	-.13 (.546)	-.49** (.016)	-.24 (.254)	.04 (.869)
Future Tense of Verbs (No O.C.s = Zero accuracy)	-.11 (.528)	-.10 (.556)	-.39** (.018)	.06 (.736)	-.10 (.553)	-.09 (.617)	-.02 (.900)	-.38** (.020)	.06 (.719)	.10 (.564)

Note: ** p<.05; * p between .05 and .99.

Chapter 5 Results

Table 35 continued. Bivariate correlations for Grammatical Accuracy measures and five independent measures.

<i>Grammatical Accuracy Measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles	-.10 (.562)	.03 (.856)	.06 (.737)	.05 (.792)	.105 (.548)	.09 (.574)	.06 (.711)	.00 (.980)	-.13 (.453)	.30* (.082)
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles (No O.C.s = Zero accuracy)	-.08 (.631)	.32 (.046)	-.20 (.228)	-.13 (.445)	.16 (.351)	.07 (.695)	.22 (.183)	-.15 (.370)	-.20 (.217)	.30* (.067)
Dependent Irregular Verbs following Negative Particles	-.06 (.753)	.09 (.611)	.00 (.985)	-.00 (.983)	.16 (.381)	.03 (.858)	.13 (.448)	.05 (.783)	-.17 (.331)	.29* (.099)
Dependent Irregular Verbs following Negative Particles (No O.C.s = Zero accuracy)	-.01 (.951)	.24 (.145)	-.17 (.297)	-.06 (.698)	.08 (.660)	.03 (.860)	.28 (.089)	-.11 (.525)	-.16 (.327)	.18 (.291)
Masculine Possessive Pronoun Lenition of Nouns	.25 (.148)	.13 (.463)	-.07 (.714)	-.15 (.402)	.14 (.458)	.26 (.145)	-.01 (.943)	.02 (.910)	-.18 (.307)	.07 (.724)
Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy)	.33** (.044)	.37** (.021)	-.14 (.411)	-.19 (.252)	.17 (.320)	.33** (.039)	.27* (.099)	-.07 (.678)	-.22 (.188)	.13 (.451)
Plural Nouns	-.17 (.291)	.27 (.101)	-.25 (.118)	-.15 (.370)	.36** (.028)	-.15 (.364)	.31* (.051)	-.27 (.103)	-.14 (.394)	.34** (.042)
Overgeneralisation of Lenition of Nouns	.07 (.684)	.12 (.487)	.29* (.077)	.16 (.335)	-.02 (.896)	.07 (.699)	.08 (.631)	.28* (.092)	.15 (.366)	.12 (.492)
Overgeneralisation of Eclipsis of Nouns	.13 (.461)	.16 (.339)	-.21 (.223)	.06 (.731)	.10 (.563)	.13 (.450)	.34** (.038)	-.22 (.196)	-.06 (.711)	.05 (.769)
Simple Prepositions	-.30* (.061)	.32** (.044)	.07 (.677)	.30* (.061)	.06 (.721)	-.34** (.035)	.35** (.029)	.12 (.453)	.24 (.143)	.08 (.657)
'San' preceding Nouns beginning with Vowels	.13 (.594)	.40* (.091)	.06 (.824)	-.23 (.337)	.39 (.109)	.09 (.702)	.06 (.799)	.06 (.824)	-.23 (.337)	.39 (.109)
'San' preceding Nouns beginning with Vowels (No O.C.s = Zero accuracy)	-.04 (.818)	.09 (.580)	.27* (.096)	.01 (.947)	.07 (.669)	-.04 (.792)	-.01 (.956)	.27* (.096)	.01 (.947)	.07 (.669)
'San' preceding Nouns beginning with Consonants	-.11 (.556)	-.14 (.423)	.09 (.616)	.17 (.336)	-.16 (.373)	-.07 (.691)	-.36** (.038)	.14 (.424)	.13 (.479)	-.08 (.681)

Note: ** p<.05; * p between .05 and .99.

Chapter 5 Results

Table 35 continued. Bivariate correlations for Grammatical Accuracy measures and five independent measures.

<i>Grammatical Accuracy Measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Simple Verbal Complement Clauses	.36* (.075)	.40** (.048)	.03 (.902)	-.15 (.476)	.15 (.494)	.26 (.216)	.25 (.231)	.03 (.883)	.09 (.660)	.12 (.598)
Simple Verbal Complement Clauses (No O.C.s = Zero accuracy)	.35** (.028)	.13 (.448)	-.16 (.329)	-.07 (.682)	.09 (.607)	.31* (.059)	.09 (.568)	-.15 (.350)	-.01 (.949)	.07 (.681)
Special Word Order in Transitive Verbal Complement Clauses	.43** (.030)	.53** (.006)	.11 (.589)	.02 (.934)	.53** (.008)	.44** (.026)	.47** (.017)	.10 (.643)	.01 (.974)	.57** (.004)
Special Word Order in Transitive Verbal Complement Clauses (No O.C.s = Zero accuracy)	.45** (.004)	.29* (.073)	.14 (.390)	.13 (.428)	.33** (.045)	.48** (.002)	.21 (.191)	.12 (.468)	.12 (.464)	.35** (.033)
Direct Relative Clauses	.03 (.880)	-.13 (.488)	-.02 (.932)	-.22 (.221)	.03 (.856)	.04 (.833)	-.24 (.194)	.05 (.769)	-.23 (.200)	.06 (.764)
Direct Relative Clauses (No O.C.s = Zero accuracy)	.02 (.928)	-.03 (.843)	.00 (.986)	.01 (.933)	.07 (.687)	-.01 (.963)	-.06 (.705)	.03 (.856)	-.04 (.792)	.08 (.639)
Propositional and Adjectival Complement Clauses	-.03 (.906)	.29 (.190)	.02 (.916)	.13 (.561)	.31 (.183)	-.07 (.771)	.25 (.258)	.05 (.829)	.12 (.598)	.33 (.160)
Propositional and Adjectival Complement Clauses (No O.C.s = Zero accuracy)	.27* (.096)	.16 (.332)	.07 (.666)	.16 (.334)	.18 (.297)	.29* (.074)	.19 (.248)	.10 (.535)	.15 (.369)	.20 (.240)
Adverbial Complement Clauses	-.29 (.139)	-.29 (.130)	-.10 (.631)	.02 (.937)	.24 (.241)	-.42** (.025)	-.37* (.056)	-.08 (.703)	.10 (.615)	.02 (.921)
Adverbial Complement Clauses (No O.C.s = Zero accuracy)	.05 (.745)	-.18 (.267)	-.26 (.110)	.12 (.481)	.10 (.566)	-.01 (.948)	-.17 (.294)	-.26 (.116)	.14 (.405)	.04 (.829)
Direct Speech Complement Clauses	Dependent variable is constant. Statistics cannot be computed.									
Direct Speech Complement Clauses (No O.C.s = Zero accuracy)	-.13 (.441)	-.11 (.516)	.03 (.867)	.35** (.028)	-.24 (.152)	-.12 (.457)	.02 (.902)	.03 (.867)	.35** (.028)	-.24 (.152)

Note: ** p<.05; * p between .05 and .99.

Chapter 5 Results

Table 35 continued. Bivariate correlations for Grammatical Accuracy measures and five independent measures.

<i>Grammatical Accuracy Measures</i>	Pearson's					Spearman's rho				
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Pseudo-cleft Constructions	.50* (.081)	.46 (.110)	-.11 (.733)	-.20 (.505)	-.04 (.906)	.40 (.172)	.36 (.224)	-.07 (.831)	-.26 (.389)	-.09 (.733)
Pseudo-cleft Constructions (No O.C.s = Zero accuracy)	.12 (.475)	.23 (.155)	-.01 (.959)	-.01 (.954)	.01 (.945)	.16 (.325)	.34** (.033)	-.03 (.870)	.03 (.836)	.04 (.821)
Preverbal Particles	-.21 (.212)	-.18 (.290)	.24 (.146)	.17 (.324)	-.20 (.247)	-.26 (.121)	-.25 (.141)	.22 (.198)	.07 (.681)	-.18 (.302)
Preverbal Particles (No O.C.s = Zero accuracy)	-.22 (.171)	-.08 (.613)	.05 (.747)	.12 (.468)	-.20 (.226)	-.28* (.079)	-.14 (.402)	.17 (.308)	.09 (.574)	-.22 (.141)
Adjective Agreement with Plural Nouns	-.08 (.721)	.23 (.294)	.01 (.976)	-.24 (.284)	.14 (.554)	-.09 (.704)	.02 (.925)	.05 (.810)	-.22 (.323)	.13 (.581)
Adjective Agreement with Plural Nouns (No O.C.s = Zero accuracy)	.03 (.878)	.16 (.338)	-.13 (.446)	-.21 (.203)	.13 (.454)	.01 (.952)	.07 (.685)	-.14 (.396)	-.24 (.149)	.10 (.541)
'ag' preceding Verbal Nouns	.13 (.426)	.07 (.661)	.04 (.802)	-.30* (.068)	.24 (.159)	.05 (.762)	.03 (.852)	.10 (.547)	-.29* (.077)	.29* (.068)
Article Agreement with Plural Nominative Case Nouns	-.14 (.422)	.39** (.019)	.21 (.221)	.02 (.906)	.42** (.012)	-.23 (.180)	.18 (.302)	.08 (.629)	.03 (.850)	.40** (.012)
Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero accuracy)	.00 (.988)	.43** (.007)	.09 (.610)	-.05 (.777)	.42** (.010)	-.07 (.673)	.23 (.158)	-.02 (.926)	-.04 (.836)	.40** (.010)

Note: ** p<.05; * p between .05 and .99.

Chapter 5 Results

Table 35a. Relative importance of five determiner variables for Grammatical Accuracy based on bivariate correlations presented in Table 35.

	Pearson's				Spearman's rho					
	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education	Age in Months	Proportion Irish Input Since Birth	Birth Order	Gender	Maternal Education
Significant** relationships indicating improvement as the independent variable increases (or, in the case of gender indicating an advantage for girls).	6	9	4	1	6 ¹	4 ²	8 ³	4	1	5
Near significant* relationships indicating improvement as the independent variable increases (or, in the case of gender, indicating an advantage for girls).	4 ⁴	3	1 ⁵	1	0	3 ⁶	3 ⁷	0	0 ⁸	4 ⁹
Total significant and near significant relationships which indicate improvement as independent variables increase (or in the case of gender, indicating an advantage for girls).	10	12	5	2	6	7	11	4	1	9

Note: ** $p < .05$; * p between .05 and .99. ¹ Accuracy on Go + eclipsis deteriorates as Maternal Education increases because Go + eclipsis obligatory contexts become more frequent; ² Two measures, Adverbial Complements and Simple prepositions decrease in accuracy as Age increases because obligatory contexts become more frequent and diverse; ³ One measure, 'San' + C, decreases as Input increases. This is considered an improvement because the use of the preposition 'san' before a consonant (C) is not found in the parent group and is therefore considered a grammatical error; ⁴ Simple prepositions decrease in accuracy as age increases due to their increased frequency and diversity in the children's stories; ⁵ One measure, Overgeneralisation of Lenition, increases as Birth Order decreases indicating that first born children did more overgeneralising of lenition than later born children. This can be considered to be in line with other results of this study; ⁶ One measure, Preverbal Particles, decreases with Age, again, because frequency of obligatory contexts increases; ⁷ The accuracy of Adverbial Complements decreases as Input increases because children with higher Irish Input produce a greater number and greater diversity of obligatory contexts for Adverbial Complements; ⁸ On one measure, boys are found to outperform girls: 'ag' preceding verbal noun; ⁹ Again Go + eclipsis, decreases in accuracy as Maternal Education increases because obligatory contexts increase.

5.6.3 Grammatical Accuracy: distribution and trend tests

Tables 36 and 37 present the results of distribution and trend tests for 44 Grammatical Accuracy measures across levels of the five independent variables: Age, Irish Input, Birth Order, Gender and Maternal Education. As these tables are relatively long, a count of significant and near significant relationships which reflect an increase in Grammatical Accuracy with the independent variable (or, in the case of gender, a female advantage) is given for each table in Tables 36a and 37a respectively in order to allow easy comparison across independent variables.

The main findings presented in Tables 36, 36a, 37 and 37a is that, overall, distribution and trend tests, like correlation tests, reflect improvement in Grammatical Accuracy with Irish Input, Age and Maternal Education.

Relationship directions (significant and insignificant) between Grammatical Accuracy and Irish Input reflect improvement in Grammatical Accuracy with increased Irish Input on four-fifths of Grammatical Accuracy measures. The remaining measures, and therefore a minority, reflect relationships (significant and insignificant) in the opposite direction. Striking also is that thirteen Grammatical Accuracy measures have significant / near significant relationships which reflect improvement with Irish Input whereas only one measure of Grammatical Accuracy has a relationship with Irish Input which nears significance and reflects the opposite: a deterioration in accuracy with rise in Irish Input (Adverbial Complements).

Relationship directions (significant and insignificant) between Grammatical Accuracy and Age reflect improvement in Grammatical Accuracy with Age on between just over a half and two-thirds of measures. The remaining measures and therefore a minority, reflect relationships (significant and insignificant) in the opposite direction. Noteworthy also is that nine measures of Grammatical Accuracy have significant / near significant relationships which reflect improvement with Age whereas only four

measures of Grammatical Accuracy have significant /near significant relationships with Age which reflect a deterioration in Accuracy with Age (Simple Prepositions; Adverbial Complements; Total Direct Relatives (No O.C.s = Zero accuracy); Preverbal Particles (No O.C.s = Zero accuracy)).

Relationship directions (significant and insignificant) between Grammatical Accuracy and Maternal Education reflect improvement in Grammatical Accuracy with increased Maternal Education on over four-fifths of Grammatical Accuracy measures. Nine measures of Grammatical Accuracy have significant / near significant relationships which reflect improvement with Maternal Education whereas only one measure of Grammatical Accuracy has a significant / near significant relationship with Maternal Education which reflects a deterioration with increasing Maternal Education (Go + eclipsis).

In general, Birth Order and Gender have lesser relationships with less consistent directions with the Grammatical Accuracy language domain. Relationship directions (both significant and insignificant) between Grammatical Accuracy measures and Birth Order reflect improvement in Grammatical Accuracy with increase in Birth Order on only two-fifths of measures the remaining measures and therefore a majority have relationships which suggest a deterioration with Birth Order. Nevertheless, disproportionately, there are five significant / near significant relationships with Birth Order that reflect an improvement in Grammatical Accuracy with rising Birth Order and only one that reflects a deterioration with rising Birth Order (San + V (No O.C.s = Zero accuracy)).

Finally, relationship directions (both significant and insignificant) between Grammatical Accuracy measures and Gender reflect an advantage for girls on only two-fifths of measures. In three-fifths of measures, directions suggest an advantage of boys over girls in Grammatical Accuracy. Only one measure of Grammatical Accuracy (Direct Speech (No O.C.s = Zero Accuracy)) has a significant relationships which reflects an advantage of girls over boys and only one ('ag' preceding verbal noun) has a near

Chapter 5 Results

significant relationship with Gender which both reflects the opposite advantage of boys over girls.

Chapter 5 Results

Table 36. Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Age groups.

<i>Grammatical Accuracy measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years .		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Past Tense Lenition	1.88 (.392)	1.36 (.170)	1.31 (.252)	1.15 (.252)	1.44 (.230)	1.20 (.230)
Past Tense Proclitic d'	3.40 (.183)	1.31 (.190)	.33 (.569)	.57 (.569)	3.21* (.073)	1.79* (.073)
Past Tense Proclitic d' (No O.C.s = Zero accuracy)	3.33 (.189)	1.81* (.071)	2.56 (.110)	1.60 (.110)	2.35 (.126)	1.53 (.126)
Past Tense Lenition of 'bí'	.64 (.726)	.56 (.579)	.60 (.438)	.78 (.438)	.04 (.849)	.19 (.849)
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a'	7.94** (.019)	2.25 (.025)	2.89* (.089)	1.70* (.089)	7.94** (.005)	2.82** (.005)
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a' (No O.C.s = Zero accuracy)	10.80** (.005)	3.12** (.002)	10.22** (.001)	3.20** (.001)	4.75** (.029)	2.18** (.029)
Eclipsis of Verbs following the Complementiser 'go'	1.56 (.459)	1.24 (.217)	1.40 (.237)	-1.18 (.237)	.78 (.378)	-.88 (.378)
Eclipsis of Verbs following the Complementiser 'go' (No O.C.s = Zero accuracy)	.92 (.632)	-.85 (.398)	.91 (.339)	-.96 (.339)	.26 (.612)	-.51 (.612)
Future Tense of Verbs	.05 (.976)	.00 (1.000)	.01 (.915)	.11 (.915)	.01 (.917)	-.104 (.917)
Future Tense of Verbs (No O.C.s = Zero accuracy)	.45 (.797)	.00 (1.000)	.11 (.736)	.34 (.736)	.11 (.741)	-.330 (.741)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 36 continued. Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Age groups continued.

<i>Grammatical Accuracy measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years .		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles	1.69 (.430)	1.01 (.312)	.15 (.696)	.39 (.696)	1.65 (.200)	1.28 (.200)
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles (No O.C.s = Zero accuracy)	2.33 (.312)	.81 (.418)	.00 (.982)	-.02 (.982)	1.78 (.182)	1.34 (.182)
Dependent Irregular Verbs following Negative Particles	1.88 (.391)	.39 (.694)	.17 (.677)	-.42 (.677)	1.00 (.317)	1.00 (.317)
Dependent Irregular Verbs following Negative Particles(No O.C.s = Zero accuracy)	4.27 (.118)	.22 (.827)	.87 (.351)	-.93 (.351)	1.41 (.236)	1.19 (.236)
Masculine Possessive Pronoun Lenition of Nouns	1.98 (.372)	1.33 (.184)	1.94 (.164)	1.39 (.164)	.76 (.382)	.87 (.382)
Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy)	4.47 (.107)	1.76* (.078)	4.46** (.035)	2.11** (.035)	.88 (.348)	.94 (.348)
Plural Nouns	.39 (.825)	-.49 (.627)	.39 (.535)	-.62 (.535)	.08 (.785)	-.27 (.785)
Overgeneralisation of Lenition of Nouns	.92 (.632)	.37 (.715)	.60 (.440)	.77 (.440)	.02 (.883)	-.15 (.883)
Overgeneralisation of Eclipsis of Nouns	.99 (.610)	.94 (.349)	.96 (.328)	.98 (.328)	.36 (.548)	.60 (.548)
Simple Prepositions	4.21 (.122)	-1.95* (.051)	3.21* (.073)	-1.79* (.073)	2.98* (.085)	-1.73* (.085)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 36 continued. Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Age groups continued.

<i>Grammatical Accuracy measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years .		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
'San' preceding Nouns beginning with Vowels	.68 (.713)	.79 (.430)	.57 (.452)	.75 (.452)	.33 (.564)	.58 (.564)
'San' preceding Nouns beginning with Vowels (No O.C.s = Zero accuracy)	1.66 (.437)	-.21 (.833)	.72 (.395)	-.85 (.395)	.20 (.652)	.45 (.652)
'San' preceding Nouns beginning with Consonants	.12 (.940)	-.05 (.963)	.05 (.831)	-.21 (.831)	.02 (.894)	.13 (.894)
Simple Verbal Complement Clauses	3.03 (.219)	1.64 (.102)	1.29 (.256)	1.14 (.256)	2.89* (.089)	1.70* (.089)
Simple Verbal Complement Clauses (No O.C.s = Zero accuracy)	4.32 (.115)	2.06** (.039)	2.34 (.126)	1.53 (.126)	3.85* (.050)	1.96* (.050)
Special Word Order in Transitive Verbal Complement Clauses	5.41* (.067)	1.85* (.064)	1.44 (.230)	1.20 (.230)	5.40** (.020)	2.33** (.020)
Special Word Order in Transitive Verbal Complement Clauses(No O.C.s = Zero accuracy)	8.33** (.016)	2.87** (.004)	6.17** (.013)	2.48** (.013)	6.09** (.014)	2.47** (.014)
Direct Relative Clauses	5.33* (.070)	.00 (1.000)	1.45 (.228)	1.21 (.228)	1.45 (.228)	-1.21 (.228)
Direct Relative Clauses (No O.C.s = Zero accuracy)	.74 (.692)	.37 (.710)	.51** (.47)	.72** (.47)	.01* (.94)	-.08* (.94)
Propositional and Adjectival Complement Clauses	.23 (.892)	-.18 (.857)	.09 (.765)	-.30 (.765)	.07 (.795)	.26 (.795)
Propositional and Adjectival Complement Clauses (No O.C.s = Zero accuracy)	3.43 (.180)	1.77* (.076)	1.47 (.225)	1.21 (.225)	3.25* (.072)	1.80* (.072)
Adverbial Complement Clauses	4.89* (.087)	-2.10** (.036)	4.64** (.031)	-2.15** (.031)	2.11 (.146)	-1.45 (.146)
Adverbials Complement Clauses (No O.C.s = Zero accuracy)	.14 (.933)	-.22 (.825)	.12 (.732)	-.34 (.732)	.00 (.975)	-.03 (.975)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 36 continued. Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Age groups continued.

<i>Grammatical Accuracy measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years .		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Direct Speech Complement Clauses	.00 (1.000)	.00 (1.000)	.00 (1.000)	.00 (1.000)	.00 (1.000)	.00 (1.000)
Direct Speech Complement Clauses (No O.C.s = Zero accuracy)	.48 (.787)	-.67 (.504)	.22 (.636)	-.47 (.636)	.45 (.504)	-.67 (.504)
Pseudo-cleft Constructions	2.28 (.320)	1.59 (.111)	1.59 (.208)	1.26 (.208)	1.37 (.242)	1.17 (.242)
Pseudo-cleft Constructions (No O.C.s = Zero accuracy)	3.61 (.164)	1.06 (.288)	.01 (.968)	.04 (.968)	2.87* (.090)	1.69* (.090)
Preverbal Particles	2.07 (.355)	-1.03 (.304)	.12 (.729)	-.35 (.729)	1.94 (.164)	-1.39 (.164)
Preverbal Particles (No O.C.s = Zero accuracy)	3.05 (.218)	-1.36 (.173)	.35 (.552)	-.60 (.552)	2.99* (.084)	-1.73* (.084)
Adjective Agreement with Plural Nouns	2.10 (.351)	-.15 (.881)	.41 (.522)	-.64 (.522)	.25 (.619)	.50 (.619)
Adjective Agreement with Plural Nouns (No O.C.s = Zero accuracy)	2.67 (.264)	.82 (.415)	2.07 (.150)	1.44 (.150)	.00 (1.000)	.00 (1.000)
'ag' preceding Verbal Nouns	.25 (.885)	.43 (.668)	.046 (.830)	.21 (.830)	2.5 (.621)	.50 (.621)
Article Agreement with Plural Nominative Case Nouns	.93 (.630)	-.90 (.368)	.77 (.382)	-.87 (.382)	.58 (.445)	-.76 (.445)
Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero accuracy)	.26 (.877)	-.22 (.829)	.19 (.661)	-.44 (.661)	.00 (.987)	.02 (.987)

Note: ** p<.05; * p between .05 and .99

Table 36a. Relative importance of Age for Grammatical Accuracy based on Kruskal Wallis and Jonckheere trend test statistics in Table 34.

<i>Grammatical Accuracy measures</i>	3 Age Groups: 3 years; 4 years; 5 and 6 years.		2 Age Groups: 3 and 4 years; 5 and 6 years.		2 Age Groups: 3 years; 4, 5 and 6 years.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Significant** relationships indicating possible improvement as the independent variable increases	3	4 ¹	5	4 ¹	4	4
Near significant* relationships indicating possible improvement as the independent variable increases (or, in the case of gender, indicating an advantage for girls).	3	4 ²	2	1 ²	8	5 ^{2,3}
Total significant and near significant relationships which indicate possible improvement as independent variables increase (or in the case of gender, indicating an advantage for girls).	6	8	7	5	12	9

Note: ** p<.05; * p between .05 and .99 ¹ Accuracy on Adverbial Complements deteriorates as children rise through age groups because obligatory contexts for Adverbials become more frequent and diverse; ² Accuracy on Simple Prepositions may deteriorate as children rise through age groups because obligatory contexts for Simple Prepositions become more frequent and diverse; ³ Accuracy on Total Direct Relatives (No O.C.s = Zero accuracy) and Preverbal Particles (No O.C.s = Zero accuracy) may deteriorate as children rise through age groups because obligatory contexts for these measures become more frequent and more diverse.

Chapter 5 Results

Table 37 Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Input, Birth Order, Gender and Maternal Education groups .

	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
<i>Grammatical Accuracy measures</i>	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Past Tense Lenition	4.86** (.028)	2.21** (.028)	.56 (.455)	-.75 (.455)	.04 (.838)	-.21 (.838)	.61 (.434)	.78 (.434)
Past Tense Proclitic d'	7.07** (.008)	2.66** (.008)	4.90** (.027)	-2.21** (.027)	.14 (.713)	-.37 (.713)	.03 (.857)	.18 (.857)
Past Tense Proclitic d' (No O.C.s = Zero accuracy)	6.26** (.012)	2.50** (.012)	.50 (.481)	-.70 (.481)	.00 (.974)	.03 (.974)	.11 (.745)	.33 (.745)
Past Tense Lenition of 'bí'	20.66** (.000)	4.55** (.000)	4.88** (.027)	-2.21** (.027)	1.05 (.305)	-1.03 (.305)	2.07 (.150)	1.44 (.150)
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a'	.36 (.548)	-.60 (.548)	1.63 (.202)	1.28 (.202)	1.20 (.273)	-1.10 (.273)	1.05 (.305)	1.03 (.305)
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a' (No O.C.s = Zero accuracy)	.02 (.891)	.14 (.891)	.28 (.595)	.53 (.595)	.24 (.621)	-.49 (.621)	.94 (.332)	.97 (.332)
Eclipsis of Verbs following the Complementiser 'go'	.33 (.564)	.58 (.564)	.16 (.693)	.39 (.693)	.78 (.378)	-.88 (.378)	3.00* (.083)	-1.73* (.083)
Eclipsis of Verbs following the Complementiser 'go' (No O.C.s = Zero accuracy)	.45 (.503)	.67 (.503)	.03 (.853)	.19 (.853)	.18 (.674)	-.42 (.674)	.55 (.458)	-.74 (.458)
Future Tense of Verbs	.66 (.418)	-.81 (.418)	5.46** (.020)	-2.34** (.020)	1.35 (.246)	-1.16 (.246)	.03 (.864)	.17 (.864)
Future Tense of Verbs (No O.C.s = Zero accuracy)	.00 (.964)	.05 (.964)	5.23** (.022)	-2.29** (.022)	.14 (.714)	.37 (.714)	.35 (.556)	-.59 (.556)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 37 continued. Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Input, Birth Order, Gender and Maternal Education groups .

<i>Grammatical Accuracy measures</i>	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles	2.33 (.127)	1.53 (.127)	.00 (.979)	.03 (.979)	.58 (.445)	-.76 (.445)	3.02* (.083)	1.74* (.083)
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles (No O.C.s = Zero accuracy)	3.56* (.059)	1.89* (.059)	.83 (.363)	-.91 (.363)	1.56 (.212)	-1.25 (.212)	3.34* (.068)	1.83* (.068)
Dependent Irregular Verbs following Negative Particles	1.52 (.218)	1.23 (.218)	.08 (.778)	.28 (.778)	.98 (.323)	-.99 (.323)	2.73* (.098)	1.65* (.098)
Dependent Irregular Verbs following Negative Particles (No O.C.s = Zero accuracy)	1.26 (.262)	1.12 (.262)	.42 (.518)	-.65 (.518)	.99 (.320)	-.99 (.320)	1.14 (.285)	1.07 (.285)
Masculine Possessive Pronoun Lenition of Nouns	1.88 (.171)	1.37 (.171)	.01 (.908)	.12 (.908)	1.08 (.300)	-1.04 (.300)	.13 (.718)	.36 (.718)
Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy)	3.59* (.058)	1.90* (.058)	.18 (.672)	-.42 (.672)	1.77 (.184)	-1.33 (.184)	.59 (.443)	.77 (.443)
Plural Nouns	4.85** (.028)	2.20** (.028)	2.66 (.103)	-1.63 (.103)	.75 (.387)	-.87 (.387)	4.08** (.043)	2.02** (.043)
Overgeneralisation of Lenition of Nouns	.82 (.365)	.91 (.365)	2.84* (.092)	1.68* (.092)	.84 (.359)	.92 (.359)	.49 (.484)	-.70 (.484)
Overgeneralisation of Eclipsis of Nouns	.49 (.483)	.70 (.483)	1.71 (.192)	-1.31 (.192)	.14 (.706)	-.38 (.706)	.09 (.764)	.30 (.764)
Simple Prepositions accuracy	3.18* (.074)	1.78* (.074)	.58 (.446)	.76 (.446)	2.17 (.141)	1.47 (.141)	.21 (.651)	.45 (.651)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 37 continued. Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Input, Birth Order, Gender and Maternal Education groups .

<i>Grammatical Accuracy measures</i>	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
'San' preceding Nouns beginning with Vowels	1.07 (.301)	1.03 (.301)	.05 (.816)	.23 (.816)	.98 (.323)	-.99 (.323)	2.60 (.107)	1.61 (.107)
'San' preceding Nouns beginning with Vowels (No O.C.s = Zero accuracy)	.00 (.966)	.04 (.966)	2.77* (.096)	1.67* (.096)	.01 (.946)	.07 (.946)	.19 (.663)	.44 (.663)
'San' preceding Nouns beginning with Consonants	3.46* (.063)	-1.86* (.063)	.67 (.415)	.82 (.415)	.52 (.470)	.72 (.470)	.18 (.674)	-.42 (.674)
Simple Verbal Complement Clauses	1.00 (.318)	1.00 (.318)	.02 (.880)	.15 (.880)	.21 (.650)	.45 (.650)	.30 (.586)	.55 (.586)
Simple Verbal Complement Clauses (No O.C.s = Zero accuracy)	.04 (.838)	.20 (.838)	.90 (.343)	-.95 (.343)	.00 (.948)	-.07 (.948)	.18 (.675)	.42 (.675)
Special Word Order in Transitive Verbal Complement Clauses	6.81** (.009)	2.61** (.009)	.23 (.633)	.48 (.633)	.00 (.974)	.03 (.974)	7.39** (.007)	2.72** (.007)
Special Word Order in Transitive Verbal Complement Clauses (No O.C.s = Zero accuracy)	4.50** (.034)	2.12** (.034)	.54 (.461)	.74 (.461)	.56 (.456)	.75 (.456)	4.42** (.035)	2.10** (.035)
Direct Relative Clauses	.59 (.442)	-.77 (.442)	.09 (.764)	.30 (.764)	1.68 (.196)	-1.29 (.196)	.10 (.758)	.31 (.758)
Direct Relative Clauses (No O.C.s = Zero accuracy)	.11 (.737)	.34 (.737)	.03 (.853)	.19 (.853)	.07 (.788)	-.27 (.788)	.23 (.632)	.48 (.632)
Propositional and Adjectival Complement Clauses	.79 (.373)	.89 (.373)	.05 (.823)	.22 (.823)	.30 (.586)	.54 (.586)	2.02 (.155)	1.42 (.155)
Propositional and Adjectival Complement Clauses (No O.C.s = Zero accuracy)	.31 (.577)	.56 (.577)	.40 (.527)	.63 (.527)	.83 (.362)	.91 (.362)	1.41 (.234)	1.19 (.234)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 37 continued. Kruskal Wallis and Jonckheere trend statistics for Grammatical Accuracy measures across Input, Birth Order, Gender and Maternal Education groups .

	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
<i>Grammatical Accuracy measures</i>	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Adverbial Complement Clauses	3.06* (.080)	-1.75* (.080)	.15 (.695)	-.39 (.695)	.27 (.605)	.52 (.605)	.01 (.919)	.10 (.919)
Adverbial Complement Clauses (No O.C.s = Zero accuracy)	1.00 (.318)	-1.00 (.318)	2.50 (.115)	-1.58 (.115)	.72 (.397)	.85 (.397)	.05 (.826)	.22 (.826)
Direct Speech Complement Clauses	.00 (1.000)	.00 (1.000)	.00 (1.000)	.00 (1.000)	.00 (.000)	-.00 (1.000)	.00 (1.000)	.00 (1.000)
Direct Speech Complement Clauses (No O.C.s = Zero accuracy)	1.22 (.269)	-1.11 (.269)	.03 (.864)	.17 (.864)	4.72** (.030)	2.17** (.030)	2.08 (.149)	-1.44 (.149)
Pseudo-cleft Constructions	2.17 (.141)	1.47 (.141)	.05 (.820)	-.23 (.820)	.82 (.366)	-.90 (.366)	.09 (.765)	-.30 (.765)
Pseudo-cleft Constructions (No O.C.s = Zero accuracy)	.83 (.363)	.91 (.363)	.03 (.868)	-.17 (.868)	.04 (.833)	.21 (.833)	.05 (.820)	.23 (.820)
Preverbal Particles	2.27 (.132)	-1.51 (.132)	1.69 (.194)	1.30 (.194)	.18 (.675)	.42 (.675)	1.04 (.308)	-1.02
Preverbal Particles (No O.C.s = Zero accuracy)	2.79 (.095)	-1.67 (.095)	1.07 (.301)	1.03 (.301)	.33 (.567)	.57 (.567)	1.80 (.180)	-1.34 (.180)
Adjective Agreement with Plural Nouns	.77 (.380)	.88 (.380)	.06 (.804)	.25 (.804)	1.03 (.311)	-1.01 (.311)	.33 (.567)	.57 (.567)
Adjective Agreement with Plural Nouns (No O.C.s = Zero accuracy)	.17 (.680)	.41 (.680)	.74 (.389)	-.86 (.389)	2.11 (.147)	-1.45 (.147)	.39 (.534)	.62 (.534)
'ag' preceding Verbal Nouns	.09 (.768)	-.30 (.768)	.38 (.540)	.61 (.540)	3.13* (.077)	-1.77* (.077)	2.97* (.085)	1.72* (.085)
Article Agreement with Plural Nominative Case Nouns	4.02** (.045)	2.01** (.045)	.24 (.622)	.49 (.622)	.04 (.846)	.19 (.846)	5.35** (.021)	2.31** (.021)
Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero accuracy)	4.87** (.027)	2.21** (.027)	.01 (.924)	-.10 (.924)	.05 (.833)	-.21 (.833)	5.64** (.018)	2.38** (.018)

Note: ** p<.05; * p between .05 and .99

Chapter 5 Results

Table 37a. Relative importance of four grouped determiner variables for Grammatical Accuracy based on Kruskal Wallis and Jonckheere trend statistics in Table 35

<i>Grammatical Accuracy measures</i>	Proportion Irish Input Since Birth: Low; High		Birth Order: Later born; First born.		Gender: Male; Female		Maternal Education: Lower; Higher.	
	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)	Kruskal Wallis statistic (p)	Std. Jonckheere trend statistic (p)
Significant** relationships indicating improvement as the independent variable increases (or, in the case of gender indicating an advantage for girls).	9	9	4	4	1	1	5	5
Near significant* relationships indicating improvement as the independent variable increases (or, in the case of gender, indicating an advantage for girls).	5	4 ^{1,2}	2	1 ^{3,4}	0	0 ⁵	4	4 ⁶
Total significant and near significant relationships which indicate possible improvement as independent variables increase (or in the case of gender, indicating an advantage for girls).	14	13	6	5	1	1	9	9

Note: ** $p < .05$; * p between .05 and .99. ¹ Accuracy on Adverbial Complements may deteriorate as children's Irish Input increases because obligatory contexts for Adverbials become more frequent and diverse; ² One measure, 'San' + C may decrease as Irish Input increases. This is as expected because the use of 'san before a consonant is not found in the parent group and is, therefore, considered a grammatical error; ³ One measure 'San' + V (No O.C.s = Zero accuracy) shows deterioration as Birth Order increases because later born children produce less obligatory contexts for 'San' + V; ⁴ One measure, Overgeneralisation of Lenition, increases as Birth Order decreases indicating that first born children did more overgeneralising of lenition than later born children. This can be considered to be in line with other results of this study; ⁵ On one measure, boys are found to outperform girls: 'ag' preceding verbal noun; ⁶ Go + eclipsis, decreases in accuracy as Maternal Education increases because obligatory contexts increase.

5.6.4 Grammatical Accuracy: multiple regression analyses

Table 38 presents the results of multiple regression analyses with 44 Grammatical Accuracy measures as outcome variables and Age, Irish Input, Birth Order, Gender and Maternal Education as predictor variables. Again, as Table 38 is relatively long, a review of the relative importance of each predictor variable including a count of significant and near significant relationships which reflect an increase in Grammatical Accuracy with the independent variable (or, in the case of gender, a female advantage) is provided in Table 38a.

The main finding evident in Table 38 is the identification of the most useful measures of Grammatical Accuracy (in order of descending importance based on R Square values: Special Word Order, Special Word Order (No O.C.s = Zero accuracy), Past Tense Proclitic d', Article Agreement with Plural Nominative Case Nouns, Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero accuracy), Past Tense 'bí' lenition). Using the Enter method, the combination of the five predictor variables emerges as a significant explanatory model for these seven measures indicating their usefulness as language measures. The model returns the highest R Square value for Adverbial Complements, however, this is not considered to be a useful measure of Grammatical Accuracy in this study because it is found to deteriorate rather than improve with Age and Irish Input. This deterioration is probably due to the frequency and diversity of obligatory contexts increasing with Age and Irish Input. This explanatory model also approaches significance for 'a' + VN/Direct Relative, (No O.C.s = Zero accuracy), Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy), Plural Nouns, Simple Prepositions, San + V, and Adverbial Complements (No O.C.s = Zero accuracy).

Another important finding is that, consistent with correlation, distribution and trend tests, multiple regression analyses reflect improvement in Grammatical Accuracy with Irish Input and Age.

Relationship directions (significant and insignificant) between Grammatical Accuracy and Irish Input reflect improvement in Grammatical Accuracy with increased Irish Input on two-thirds of Grammatical Accuracy measures. Striking also is that nine Grammatical Accuracy measures have significant / near significant relationships which reflect improvement with Irish Input whereas only two measures of Grammatical Accuracy have significant relationships with Irish Input which reflects the opposite: a deterioration in accuracy with rise in Irish Input (Adverbial Complements and Adverbial Complements (No O.C.s = Zero accuracy)).

Relationship directions (significant and insignificant) between Grammatical Accuracy and Age reflect improvement in Grammatical Accuracy with Age on just under half of Grammatical Accuracy measures. Nevertheless, seven Grammatical Accuracy measures have significant / near significant relationships which reflect improvement with Age whereas no measures of Grammatical Accuracy have significant / near significant relationships with Age which reflect the opposite: a deterioration in accuracy with rise in Age. However, it must be noted that, when the influence of other variables is taken into account in multiple regression analyses, significant / near significant relationships with Age, although still frequent, decrease considerably in strength (absolute B coefficients are between .01 and .03 in results of multiple regression analyses). This reflects very weak relationships between Age and Grammatical Accuracy measures suggesting that overall, Grammatical Accuracy improves only minimally between three and six years of age.

When the influence of other variables is taken into account, as in multiple regression analyses, the relationships between Maternal Education and Grammatical Accuracy loses some consistency of direction and frequency of significance. Nevertheless, relationship directions (significant and insignificant) between Grammatical Accuracy and Maternal Education reflect improvement in Grammatical Accuracy with increasing Maternal Education on just over half of Grammatical Accuracy measures. Also, four Grammatical Accuracy measures have significant / near significant relationships which reflect improvement with Maternal Education whereas

no measure of Grammatical Accuracy has significant / near significant relationships with Maternal Education which reflect the opposite: a deterioration in accuracy with rise in Maternal Education.

Consistent with the results of other tests, Birth Order and Gender, when the influence of other variables is taken into account as in multiple regression analyses, generally have inconsistent relationships of low importance with Grammatical Accuracy measures.

Relationship directions (both significant and insignificant) between Grammatical Accuracy measures and Birth Order reflect improvement in Grammatical Accuracy with increase in Birth Order on just over half of Grammatical Accuracy measures (24/44). Also, there are five significant / near significant relationships with Birth Order that again reflect an improvement in Grammatical Accuracy with rising Birth Order and only one near significant relationship that represents a deterioration with rising Birth Order (Article Agreement with Plural Nominative Case Nouns).

Finally, relationship directions (both significant and insignificant) between Grammatical Accuracy measures and Gender reflect an advantage for girls on less than a half of Grammatical Accuracy Measures (19/44). The remaining directions suggest an advantage of boys over girls in Grammatical Accuracy. However, disproportionately, three measures of Grammatical Accuracy have significant / near significant relationships which reflect an advantage of girls over boys and no Grammatical Accuracy measure has a relationship with Gender which reflects the opposite advantage of boys over girls and even nears significance.

Chapter 5 Results

Table 38. Multiple regression coefficients for the prediction of Grammatical Accuracy measures.

<i>Grammatical Accuracy Measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
Past Tense Lenition	1.02 (.425)	0.141	.56** (.018)	.00 (.480) [+] Std. B: .13	.20 (.288) [+] Std. B: .21	-.05 (.498) [?/+] Std. B: -.12	.02 (.839) [+] Std. B: .04	.08 (.426) [+] Std. B: .16
Past Tense Proclitic 'd'	2.93** (.037)	0.411	.18 (.653)	.01 (.352) [+] Std. B: .18	1.10** (.012) [+] Std. B: .49	-.21* (.076) [?/+] Std. B: -.33	-.01 (.927) [+] Std. B: -.02	-.13 (.388) [+] Std. B: -.18
Past Tense Proclitic 'd'' (No O.C.s = Zero accuracy)	1.63 (.183)	0.208	-.61 (.204)	.01 (.124) [+] Std. B: .27	.89** (.025) [+] Std. B: .43	.02 (.889) [?/+] Std. B: .02	-.03 (.888) [+] Std. B: -.03	-.20 (.335) [+] Std. B: -.19
Past Tense 'bʲ' Lenition	3.58** (.011)	0.366	.43** (.004)	.00 (.183) [+] Std. B: .20	.37** (.024) [+] Std. B: .39	-.12* (.089) [?/+] Std. B: -.27	.03 (.736) [+] Std. B: .06	.78 (.444) [+] Std. B: .14
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a'	1.74 (.231)	0.522	-.19 (.812)	.01 (.230) [+] Std. B: .41	-.09 (.849) [+] Std. B: -.06	.20 (.389) [?/+] Std. B: .28	-.25 (.268) [+] Std. B: -.34	.18 (.470) [+] Std. B: .22
Lenition of Verbal Nouns / Direct Relative Verbs following the Complementiser 'a' (No O.C.s = Zero accuracy)	2.34* (.065)	0.274	-.64 (.172)	.02** (.004) [+] Std. B: .50	-.28 (.450) [+] Std. B: -.14	-.01 (.934) [?/+] Std. B: -.01	.13 (.460) [+] Std. B: .13	.17 (.392) [+] Std. B: .16
Eclipsis of Verbs following the Complementiser 'go'	4.11 (.207)	0.911	1.82 (.700)	-.02 (.565) [+] Std. B: -.45	.49 (.921) [+] Std. B: .14	-.05 (.973) [?/+] Std. B: -.06	-.46 (.599) [+] Std. B: -.46	-.99 (.611) [+] Std. B: -.76
Eclipsis of Verbs following the Complementiser 'go' (No O.C.s = Zero accuracy)	.88 (.509)	0.124	-.02 (.922)	-.00 (.443) [+] Std. B: -.14	.32 (.110) [+] Std. B: .32	.06 (.478) [?/+] Std. B: .13	-.11 (.233) [+] Std. B: -.24	-.16 (.143) [+] Std. B: -.31

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

Chapter 5 Results

Table 38 continued. Multiple regression coefficients for the prediction of Grammatical Accuracy measures.

<i>Grammatical Accuracy Measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
Future Tense of Verbs	1.43 (.264)	0.296	1.25** (.005)	-.00 (.900) [+] Std. B: -.03	-.37 (.242) [+] Std. B: -.31	-.30** (.041) [?/+] Std. B: -.49	-.01 (.918) [+] Std. B: -.02	.14 (.447) [+] Std. B: .21
Future Tense of Verbs (No O.C.s = Zero accuracy)	1.82 (.141)	0.239	1.30** (.013)	-.00 (.755) [+] Std. B: -.05	-.36 (.384) [+] Std. B: -.17	-.48** (.008) [?/+] Std. B: -.49	.19 (.314) [+] Std. B: .19	.01 (.974) [+] Std. B: .01
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles.	.22 (.952)	0.036	1.03** (.000)	-.00 (.498) [+] Std. B: -.13	-.03 (.854) [+] Std. B: -.04	.02 (.719) [+] Std. B: .07	.01 (.883) [+] Std. B: .03	.05 (.496) [+] Std. B: .15
Dependent Form of 'bí': 'raibh' / 'bhfuil' following Particles. (No O.C.s = Zero accuracy)	1.08 (.393)	0.148	.77** (.007)	-.00 (.421) [+] Std. B: -.14	.35 (.120) [+] Std. B: .31	-.04 (.644) [+] Std. B: -.08	-.08 (.417) [+] Std. B: -.16	-.00 (.991) [+] Std. B: -.00
Dependent Irregular Verbs following Negative Particles	.19 (.963)	0.034	.93** (.004)	-.00 (.712) [+] Std. B: -.07	.02 (.915) [+] Std. B: .02	.00 (.983) [+] Std. B: .00	.02 (.847) [+] Std. B: .04	.09 (.441) [+] Std. B: .18
Dependent Irregular Verbs following Negative Particles (No O.C.s = Zero accuracy)	.51 (.764)	0.076	.60 (.132)	-.00 (.852) [+] Std. B: -.03	.38 (.236) [+] Std. B: .240	-.08 (.576) [+] Std. B: -.11	-.05 (.720) [+] Std. B: -.07	-.04 (.811) [+] Std. B: -.05
Masculine Possessive Pronoun Lenition of Nouns	.63 (.682)	0.107	.28 (.435)	.01 (.213) [+] Std. B: .25	.24 (.397) [+] Std. B: .18	-.02 (.850) [?/-] Std. B: -.04	-.07 (.558) [+] Std. B: -.13	-.00 (.988) [+] Std. B: -.00
Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy)	2.15* (.086)	0.257	-.33 (.365)	.01* (.092) [+] Std. B: .28	.67** (.028) [+] Std. B: .41	-.01 (.907) [?/-] Std. B: -.02	-.13 (.338) [+] Std. B: -.18	-.10 (.508) [+] Std. B: -.02
Plural Nouns	2.17* (.083)	0.26	.86 (.000)	-.00 (.182) [+] Std. B: -.22	.09 (.573) [+] Std. B: .10	-.10 (.157) [?/+] Std. B: -.24	-.01 (.938) [+] Std. B: -.01	.16* (.075) [+] Std. B: .35
Overgeneralisation of Lenition of Nouns	.94 (.468)	0.136	-1.13 (.630)	.02 (.574) [?] Std. B: .10	2.03 (.279) [?] Std. B: .22	1.16 (.150) [?] Std. B: .27	.51 (.557) [?] Std. B: .12	-.36 (.720) [?] Std. B: -.08
Overgeneralisation of Eclipsis of Nouns	.65 (.666)	0.1	-.46 (.653)	.01 (.356) [?] Std. B: .18	.28 (.723) [?] Std. B: .07	-.44 (.204) [?] Std. B: -.25	.32 (.399) [?] Std. B: .18	.14 (.751) [?] Std. B: .07
Simple Prepositions	2.42* (.058)	0.281	.91** (.000)	-.01 (.149) [+] Std. B: -.24	.13* (.075) [+] Std. B: .32	.01 (.816) [?/+] Std. B: .04	.05 (.116) [+] Std. B: .29	.02 (.690) [+] Std. B: .08

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

Chapter 5 Results

Table 38 continued. Multiple regression coefficients for the prediction of Grammatical Accuracy measures.

<i>Grammatical Accuracy Measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
'San' preceding Nouns beginning with Vowels	2.79* (.068)	0.537	.29 (.287)	.00 (.739) [+] Std. B: .08	.72** (.014) [+] Std. B: .69	-.06 (.549) [?/+] Std. B: -.14	.07 (.560) [+] Std. B: .14	.02 (.878) [+] Std. B: .04
'San' preceding Nouns beginning with Vowels (No O.C.s = Zero accuracy)	.58 (.716)	0.085	.07 (.904)	-.00 (.881) [+] Std. B: -.03	.37 (.411) [+] Std. B: .17	.28 (.144) [?/+] Std. B: .28	-.03 (.879) [+] Std. B: -.03	.01 (.957) [+] Std. B: .01
'San' preceding Nouns beginning with Consonants	.35 (.879)	0.063	.39 (.262)	-.00 (.744) [-] Std. B: -.07	-.17 (.544) [-] Std. B: -.13	.01 (.933) [?/-] Std. B: .02	.08 (.493) [-] Std. B: .16	-.03 (.847) [-] Std. B: -.04
Simple Verbal Complement Clauses	1.71 (.187)	0.334	-.21 (.606)	.01 (.129) [+] Std. B: .35	.76** (.040) [+] Std. B: .59	.04 (.812) [?/+] Std. B: .05	-.14 (.380) [+] Std. B: -.20	-.29 (.205) [+] Std. B: -.37
Simple Verbal Complement Clauses (No O.C.s = Zero accuracy)	.94 (.472)	0.131	-.35 (.512)	.02* (.066) [+] Std. B: .34	.18 (.675) [+] Std. B: .08	-.12 (.508) [?/+] Std. B: -.12	.4214E-6 (1.0) [+] Std. B: -.00	-.02 (.916) [+] Std. B: -.02
Special Word Order in Transitive Verbal Complement Clauses	3.66** (.019)	0.504	-1.13** (.032)	.02* (.050) [+] Std. B: .42	.60 (.149) [+] Std. B: .32	.09 (.608) [?/+] Std. B: .09	-.22 (.322) [+] Std. B: .21	.28 (.241) [+] Std. B: .26
Special Word Order in Transitive Verbal Complement Clauses (No O.C.s = Zero accuracy)	4.73** (.003)	0.433	-1.19** (.005)	.02** (.002) [+] Std. B: .49	.38 (.245) [+] Std. B: .19	.07 (.622) [?/+] Std. B: .07	.32** (.039) [+] Std. B: .34	.29 (.105) [+] Std. B: .28
Direct Relative Clauses	.42 (.828)	0.078	1.01** (.000)	.00 (.932) [+] Std. B: -.02	-.08 (.486) [+] Std. B: -.16	.01 (.875) [?/+] Std. B: .03	-.06 (.284) [+] Std. B: -.24	.01 (.850) [+] Std. B: .05
Direct Relative Clauses (No O.C.s = Zero accuracy)	.17 (.971)	0.027	.78* (.072)	.00 (.657) [+] Std. B: .08	-.16 (.646) [+] Std. B: -.10	-.07 (.649) [?/+] Std. B: -.09	.11 (.500) [+] Std. B: +.14	.11 (.532) [+] Std. B: .14

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

Chapter 5 Results

Table 38 continued. Multiple regression coefficients for the prediction of Grammatical Accuracy measures.

<i>Grammatical Accuracy Measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
Propositional and Adjectival Complement Clauses	.71 (.629)	0.201	.23 (.762)	-.00 (.798) [+] Std. B: -.07	.30 (.529) [+] Std. B: .19	-.10 (.671) [?/+] Std. B: -.11	.16 (.571) [+] Std. B: .16	.31 (.318) [+] Std. B: .31
Propositional and Adjectival Complement Clauses (No O.C.s = Zero accuracy)	1.64 (.180)	0.215	-.56 (.169)	.01* (.050) [+] Std. B: .34	.14 (.654) [+] Std. B: .08	-.03 (.812) [?/+] Std. B: -.04	.26* (.084) [+] Std. B: .33	.16 (.341) [+] Std. B: .19
Adverbial Complement Clauses	4.68** (.005)	0.539	1.71** (.000)	-.01** (.035) [+] Std. B: -.36	-.75** (.001) [+] Std. B: -.75	-.10 (.237) [?/+] Std. B: -.20	.11 (.229) [+] Std. B: -.21	.44** (.001) [+] Std. B: .78
Adverbial Complement Clauses (No O.C.s = Zero accuracy)	2.14* (.087)	0.256	1.19** (.011)	.00 (.645) [+] Std. B: .08	-.86** (.021) [+] Std. B: -.43	-.35** (.024) [?/+] Std. B: -.40	.33* (.060) [+] Std. B: .35	.37* (.060) [+] Std. B: .37
Direct Speech Complement Clauses	Dependent variable is constant. Statistics cannot be computed.							
Direct Speech Complement Clauses (No O.C.s = Zero accuracy)	1.05 (.406)	0.145	1.21** (.002)	-.00 (.809) [+] Std. B: -.04	-.15 (.620) [+] Std. B: -.10	-.04 (.742) [+] Std. B: -.06	.23 (.109) [+] Std. B: .32	-.06 (.688) [+] Std. B: -.08
Pseudo-cleft Constructions	1.77 (.253)	0.596	-1.58 (.158)	.03* (.093) [+] Std. B: .67	.80 (.492) [+] Std. B: .27	-.04 (.909) [?/+] Std. B: -.04	-.43 (.179) [+] Std. B: -.49	-.33 (.291) [+] Std. B: -.35
Pseudo-cleft Constructions (No O.C.s = Zero accuracy)	.58 (.716)	0.085	-.41 (.333)	.01 (.455) [+] Std. B: .14	.51 (.137) [+] Std. B: .30	.04 (.789) [?/+] Std. B: .05	-.04 (.804) [+] Std. B: -.05	-.14 (.453) [+] Std. B: -.16

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

Chapter 5 Results

Table 38 continued. Multiple regression coefficients for the prediction of Grammatical Accuracy measures.

<i>Grammatical Accuracy Measures</i>	Total F (p)	R Square	Constant Beta (p)	Age in Months Beta (p) [expected sign] Standardised Beta.	Proportion of Irish Input Since Birth Beta (p) [expected sign] Standardised Beta.	Birth Order Beta (p) [expected sign] Standardised Beta.	Gender Beta (p) [expected sign] Standardised Beta.	Maternal Education Beta (p) [expected sign] Standardised Beta.
Preverbal Particles	.86 (.522)	0.129	1.06** (.000)	-.00 (.362) [+] Std. B: -.17	-.03 (.362) [+] Std. B: -.09	.03 (.288) [?/+] Std. B: .20	.01 (.781) [+] Std. B: .06	-.02 (.635) [+] Std. B: -.10
Preverbal Particles (No O.C.s = Zero accuracy)	.57 (.723)	0.084	1.19** (.000)	-.00 (.261) [+] Std. B: -.21	-.00 (.995) [+] Std. B: -.00	.03 (.751) [?/+] Std. B: .06	-.00 (.978) [+] Std. B: -.01	-.08 (.451) [+] Std. B: -.16
Adjective Agreement with Plural Nouns	.64 (.670)	0.177	.12 (.859)	-.00 (.813) [+] Std. B: -.06	.75 (.218) [+] Std. B: .41	.16 (.491) [?/+] Std. B: .19	-.34 (.168) [+] Std. B: -.41	-.15 (.636) [+] Std. B: -.15
Adjective Agreement with Plural Nouns (No O.C.s = Zero accuracy)	.51 (.765)	0.076	.14 (.790)	-.00 (.876) [+] Std. B: -.03	.36 (.404) [+] Std. B: .17	-.05 (.774) [?/+] Std. B: -.05	-.20 (.318) [+] Std. B: -.21	-.01 (.953) [+] Std. B: -.01
'ag' preceding Verbal Nouns	.77 (.580)	0.11	.44 (.100)	.00 (.506) [+] Std. B: .12	.08 (.697) [+] Std. B: .08	.02 (.799) [?/+] Std. B: .05	-.10 (.315) [+] Std. B: -.20	.06 (.594) [+] Std. B: .11
Article Agreement with Plural Nominative Case Nouns	3.59** (.012)	0.39	.32 (.460)	-.01 (.154) [+] Std. B: -.23	.60* (.075) [+] Std. B: .30	.23* (.088) [?/+] Std. B: .28	.05 (.732) [+] Std. B: .06	.37** (.032) [+] Std. B: .40
Article Agreement with Plural Nominative Case Nouns (No O.C.s = Zero Accuracy)	2.65** (.042)	0.307	-.01 (.973)	-.00 (.629) [+] Std. B: -.08	.69** (.045) [+] Std. B: .37	.14 (.318) [?/+] Std. B: .17	.01 (.959) [+] Std. B: .01	.28 (.121) [+] Std. B: .30

Note: ** p<.05; * p between .05 and .99. [expected sign] denotes expected direction based on literature and theory.

Table 38a. Relative importance of five predictor variables for Grammatical Accuracy based on results of multiple regression analyses presented in Table 38.

	Age in Months***	Proportion of Irish Input	Birth Order	Gender	Maternal Education
Significant** relationships indicating improvement as the predictor variable increases (or, in the case of gender indicating an advantage for girls).	2 ¹	7 ²	3	1	2
Near Significant* relationships indicating improvement as the predictor variable increases (or, in the case of gender indicating an advantage for girls).	5	2	2 ³	2	2
Total Significant and Near Significant relationships as outlined above.	7	9	5	3	4
Total Grammatical Accuracy measures for which predictor variable was both significant/near significant and of primary importance (as gauged by a comparison of Standardised Beta coefficients)	6	8 ⁴	2	0	3

Note: *** All significant or near significant relationships between Age and Grammatical Accuracy are very weak (B = between .01 and .03) ** p<.05; * p between .05 and .99. ¹ Accuracy on Adverbial Complements deteriorates as Age increases because obligatory contexts become more diverse. ² Accuracy on Adverbial Complements and Adverbial Complements (No O.C.s = Zero accuracy) deteriorates as Irish Input increases because obligatory contexts become more diverse. ³ Article Agreement with Plural Nominative Case Nouns may become more accurate as Birth Order decreases indicating an advantage for first born children over later born children on this measure. This was inconsistent with results across tests and language domains in this study. ⁴ Adverbial Complements (No O.C.s = Zero accuracy) deteriorates as Irish Input increases because obligatory contexts become more diverse.

5.6.5 Grammatical Accuracy: summary

In summary, the general pattern of relationship directions (whether significant or insignificant) across all three sets of tests is that the majority of Grammatical Accuracy measures improve with Irish Input, Maternal Education and Age. At least two thirds improve in each set of tests in the case of Irish Input and at least just over a half in the cases of Age and Maternal Education. Children's performance is found to deteriorate with Irish Input, Age and Maternal Education in the remaining measures, for example, those related to the accuracy of adverbial complement clauses. It is possible that this impression of deterioration in performance is due to poor measure design and not to true deterioration in children's ability in these areas. On investigation it became clear that these measures were often conceived too broadly, encompassing too many different subtypes. The deterioration in these cases is likely to be because as Irish Input, Age and Maternal Education increase, children's productions of the relevant measures become more frequent (e.g. Irish Input and Number of Instances of Complex Syntax $P = .35$, $p = .031$; Irish Input and Ratio of Complex Syntax to Propositions $P = .42$, $p = .008$) and also more diverse, including more challenging subtypes. Overall, across tests, the number of significant / near significant relationships, which reflect an improvement in Grammatical Accuracy measures with Irish Input, Age and Maternal Education far outweigh the number which reflect the opposite: a deterioration.

Input emerges as a more important predictor of Grammatical Accuracy measures than either Age or Maternal Education. When the influence of other independent variables is taken into account the relationships between Grammatical Accuracy and Age and Grammatical Accuracy and Maternal Education lose strength and consistency respectively. Importantly, Irish Input, on the other hand, remains relatively strong and consistent in its relationship with Grammatical Accuracy measures across all tests.

With regard to the remaining two independent variables, Birth Order and Gender were found to play the least frequently significant and the least consistent roles in Grammatical Accuracy across tests.

In correlation, distribution and trend tests, directions of relationships (both significant and insignificant) indicate that first born children may have an advantage over later born children on a majority of Grammatical Accuracy measures, however, in general, significant / near significant relationships are slightly more frequently found to reflect the opposite: that later born children have an advantage over first born children. Further, in multiple regression analyses results this later born advantage is maintained in both significant / near significant relationships and the direction of the majority of relationships (both significant and insignificant). On the whole, evidence for an advantage for later born in Grammatical Accuracy is, however, still quite weak.

Across tests, relationship directions (both significant and insignificant) indicate that boys may have an advantage over girls on a majority of Grammatical Accuracy measures however, in general, significant / near significant relationships are slightly more frequently found to reflect the opposite: that girls have the advantage over boys. On the whole, evidence for the advantage of either sex in Grammatical Accuracy measures is also weak.

Finally, as previously stated, the most useful measures of Grammatical Accuracy in terms of established statistical interdependencies: Special Word Order, Past Tense Proclitic 'd', Article Agreement with Plural Nominative Case Nouns and Past Tense 'bí' lenition are identified by relatively high R Square¹⁰ coefficients in results of multiple regression analyses. This evidence of established statistical interdependencies is corroborated by further such evidence across the correlation, distribution and trend tests.

¹⁰ As previously mentioned, the model returns the highest R Square coefficient for Adverbial Complements, however, this is not considered to be a useful measure of Grammatical Accuracy in this study because it is found to deteriorate with Age and Input.

These four Grammatical Accuracy measures are found to have significant relationships in the expected direction with at least two independent variables in these tests. Other Grammatical Accuracy measures are only found to have such relationships with one other independent variable or with two in only one or two tests.¹¹ In general, these measures also have relatively strong significant and near significant relationships with Irish Input across correlation, distribution and trend tests and multiple regression analyses. Significant relationships with Age are also relatively strong in correlation, distribution and trend tests. However, when the influence of other predictor variables is taken into account in multiple regression analyses, significant and near significant relationships with Age are very weak (absolute B coefficients are between .01 and .03). This suggests that Grammatical Accuracy improves only minimally between three and six years of age.

Taking these findings together, Grammatical Accuracy measures such as Special Word Order, Past Tense Proclitic ‘d’, Article Agreement with Plural Nominative Case Nouns and Past Tense ‘bí’ lenition present as useful ways of capturing language proficiency in the population examined. Nevertheless, the expected improvement with Age in this language domain is minimal. Several possible reasons for this will be considered in the Discussion chapter.

5.7 Conclusion

This chapter of empirical findings has presented an investigation of the importance of a set of well-motivated determining variables in respect to multiple measures of four language domains, across the children in the sample. In particular, five complementary tests are adopted including parametric and non-parametric correlation tests, non-parametric distribution

¹¹ Plural Nouns has a significant relationship with both Input and Maternal Education in distribution and trend tests but only with Maternal Education in correlation tests. Simple Prepositions has significant relationships with Age and Input in non-parametric correlation tests but not across other tests. Masculine Possessive Pronoun Lenition of Nouns (No O.C.s = Zero accuracy) has relationships with Age and Input in correlation tests but only with Birth Order in distribution and trend tests.

and trend tests and parametric multiple regression analyses to investigate the relative importance of the determining variables. Several statistical tests were used in order to test for robustness of findings across methodologies. The language domains which were assessed across children in the sample are Productivity, Multi-clause Syntax, Verb Vocabulary and Grammatical Accuracy. The set of determining variables comprise Age, Proportion Irish Input Since Birth, Birth Order, Gender and Maternal Education.

Following clear findings in the literature and indicative of the quality and reliability of the data gathered, Productivity, Multi-clause Syntax and Verb Vocabulary increase, in the first instance, with Age. It is also interesting to note that Multi-clause Syntax has an additional relatively strong relationship with Birth Order. Specifically, this evidence indicates that later born children tend to have an advantage over first born children in this language domain. This is also the case for particular measures of Productivity when the influence of other independent variables is taken into account.

Turning to secondary influences on these three language domains, other independent variables: Proportion Irish Input Since Birth, Gender and Maternal Education have evident influence of varying importance on the abovementioned language domains. In general, when significant effects were found: girls, children with higher Maternal Education and children with higher Proportion Irish Input Since Birth tended to outperform their peers. Interestingly, Productivity was found to be relatively independent of Proportion Irish Input since Birth distinguishing it as a possible universal language domain, at least for this age group and the level of cumulative Irish Input amassed by children in this study.

In contrast, Grammatical Accuracy measures improve primarily as Proportion Irish Input Since Birth increases and secondarily with Age and Maternal Education. Improvement with Age in Grammatical Accuracy is, however, minimal between three and six years of age. Also, Maternal Education has a reduced influence on Grammatical Accuracy measures when the effect of other independent variables is taken into account. It is

Chapter 6 Discussion

noteworthy that Birth Order and Gender only occasionally influence Grammatical Accuracy performance. These relationships with independent variables, particularly with Age, raise further questions regarding the development of Grammatical Accuracy in this population. Discussion addressing these questions will be presented in the Discussion Chapter.

Finally, the most useful measures of each language domain, in terms of established statistical interdependencies were also indicated. These were identified by relatively high R square coefficients returned by multiple linear regression analyses and corroborated by results from other tests. These particularly useful measures are reiterated in Table 39 below.

Table 39. Most useful measures of each language domain according to R square coefficients and corroborated by evidence across other tests.

Language domain	Language measure	Percentage of variance explained by the predictor variable model
Productivity	Number of Words in T-Units	34.3
	Number of Words in Propositions	33.9
	Mean Length of Propositions in Words	29.9
Multi-clause Syntax	MLU in Words	39.6
	MLTU in Words	38.2
	Total Instances of Multi-Clause Syntax	35.3
	Ratio of Complex Syntax to Utterances	30.4
	Number of Instances of Complex Syntax	30
Verb Vocabulary	Number of Verb Types	32.2
Grammatical Accuracy*	Special Word Order	50.4
	Past Tense Proclitic d'	41.1
	Article Agreement with Plural Nominative Case	39
	Past Tense 'bí' Lenition	36.6

Note: *When original measures and their 'No Obligatory Contexts = Zero Accuracy' equivalents (see page 174 for explanation) were both found to have relatively high R squared coefficients, only the original measures are included as these are considered the more faithful reflectors of accuracy.

Chapter 6 Discussion

6.1 Introduction

In this final chapter, there is a review of chapter content, a summary of the thesis, a discussion of its main findings and an overview of its theoretical and clinical implications. Areas for future research are also identified.

6.2 Review of chapter content

The first chapter presented an introduction to the study including a discussion of its clinical motivation. It also highlighted the gaps in research in the field of L1 Irish language acquisition and described the sociolinguistic context providing motivation for a relatively deep investigation of language input factors. Chapter 2, comprises a discussion of the effects of quantity and quality of input, age, gender, SES and birth order on language development based on a review of the literature. In Chapter 3, a linguistic description of the Irish language was provided. The methodological approach adopted in this study, the methods of recruitment and selection of participants and data collection and analysis are described and justified. The characteristics of the child and parent participant groups were also described. Results were presented in Chapter 5. Finally, in the current chapter the contribution to knowledge is discussed, its clinical and other implications are drawn and areas for further research are identified.

6.3 Summary of the thesis

The aim of this thesis is to investigate, for clinical purposes, typical Irish language production in bilingual L1 Irish speaking children. Prior to this study there was not sufficient information available on typical L1 Irish

language acquisition to facilitate clinical language assessment in this population of 3-6 year olds. To this end, children's language production and quantity and quality of input were investigated using child story retell tasks and parent story generation tasks and parent questionnaires. Narratives were used as they are a broad and rich source of language data. For the children, narrative retell rather than generation was used as the age group included children who were quite young and would as a result be unlikely to produce an extended monologue without a model. The parents' language also needed to be analysed because a sufficient description of the language of this age group, i.e. the quality of the children's language input, was not available. It was necessary to measure quantity of input in Irish relative to any other language(s) the child was hearing as this is widely acknowledged in the literature to have an impact on rate and order of language development. Results (as outlined in the previous chapter) demonstrated the influence of quantity and quality of language input as well as demographic factors on Irish language acquisition and identified clinically useful measures of Irish language acquisition.

6.4 Discussion of main findings

The main findings of this thesis are in the description of children's performance in different language domains in light of language input and demographic factors. Summary statistics for each language measure are provided for clinical comparison.

As expected, based on a review of the literature on other languages, Productivity, Multi-clause Syntax and Verb Vocabulary increase, in the first instance, with Age. As children grow older, their sentences become more numerous, longer and more complex and include a greater variety of vocabulary. For this reason, these are clinically useful Irish language measures.

Further, this study indicated that later born children tend to have an advantage over first born children in Multi-clause Syntax. This is also the

case for some measures of Productivity. This later born advantage was unexpected as the literature on the effect of birth order predicts that later born children are slower language developers in all areas except possibly conversational skills and pronouns. Cultural differences may somewhat explain the unusual birth order effects found in this study. Most of the research on the relation between birth order and language development has been done with majority language speaking children in urban areas in the US and to a lesser extent in Canada, the UK, Sweden and France. As discussed in the Introduction Chapter, increased interaction with extended family may reduce any later born disadvantage and the weaker link between large families and low SES in the rural west of Ireland may reduce any impression of later born disadvantage. Finally, perhaps the method of data collection on language production favoured later born children in some way. It may be the case that later born children are more adaptable to new challenges than first born children who may be more sheltered or supported.

Again, as expected based on the literature, when significant effects were found, girls, children with higher Maternal Education and children with higher Proportion Irish Input Since Birth tended to outperform their peers in Multi-clause Syntax and Verb Vocabulary. Girls and children with higher Maternal Education also outperformed their peers in Productivity. In contrast with what was conjectured in the literature review chapter, girls at this age did not appear to be subject to more influence from the language shift continuum than boys, at least not to the extent that it cancelled out other factors which result in girls holding the advantage. Interestingly, Productivity was found to be relatively unaffected by Proportion Irish Input Since Birth, distinguishing it as a possible universal language domain across children with different language backgrounds, at least for this age group and the level of cumulative Irish Input amassed by the children in this study. This is very useful information in the clinical setting where resources are often limited and may not always stretch to adequate investigation of quantity of input.

Grammatical Accuracy measures were found to improve primarily as Proportion Irish Input Since Birth increases and secondarily with Age and Maternal Education. The literature predicts that age would have a major influence on Grammatical Accuracy in this age group and yet, for this Irish speaking population, this is not the case. Surprisingly, improvement with age was found to be minimal. The effect of Maternal Education on Grammatical Accuracy was also very small relative to the effect of Proportion Irish Input Since Birth.

6.4.1 Investigating why there is a lack of grammatical accuracy development with age.

Irish Grammatical Accuracy development is found to be different from what was expected based on what happens in other languages, on previous studies involving younger Irish speaking children and finally, on what happens in other Irish language domains in this study. The relatively strong relationship seen between age and the development of grammatical accuracy in other languages (e.g. in Brown, 1973; Miller, 1981; Bates, 2004), in younger Irish speaking children (e.g. in Hickey 1990a, 1990b, 1991, 1992; O Toole, 2009) or in development in other Celtic languages (Thomas and Gathercole, 2007) and between age and other language domains in this study, are not evident here. In fact, as seen in the Results Chapter, some grammatical accuracy measures seem to have no relationship with Age or any of the other independent variables. Age is the independent variable most relevant to this study's aims because in order to distinguish between typical language acquirers and children with language disorders it is necessary to find measures of language domains that develop as children get older.

Considered here are several reasons for the lack of relationship between Grammatical Accuracy and Age in the group of children studied. The first is the presence of inconsistency in the parents' language. Next is the minimal development of grammatical accuracy in 3-6 year olds even in those areas in which parents were consistent. Finally, we consider a likely explanation for

both of these phenomena. Through these investigations we come to a better understanding of how language is being learned by this group.

6.4.1.1 Consistency and inconsistency in parents' language

An important finding of this study and one that is highly relevant to the investigation as to why there is a lack of grammatical accuracy development with age is that some grammatical constructions were produced consistently by the parent group and others were produced inconsistently. The accuracy of the latter grammatical constructions was not hypothesised to have a relationship with Age in children. Examples of measures on which parents were inconsistent are illustrated in graphs in the results chapter (Figures 5, 6, 9, 10, 11, 12). Children's lack of development with Age on these measures is also illustrated in the results chapter (Figures 5a, 6a, 9a, 10a, 11a, 12a). Grammatical acquisition is widely agreed to be based on the child identifying patterns in their input (Goldberg, 1995; 2006; Tomasello, 2003) even if only partially so (Chomsky, 1965). It follows that children faced with input with grammatical patterns which have been disintegrated by inconsistency, will not acquire those grammatical patterns. In the case of Irish, patterns of inflection may be even more broken down than reflected in the frequent inconsistent performances of adults in this study as it is likely that more English language words (generally not inflected in Irish language discourse) are used in everyday language relative to language used in the research setting. We can presume that the typical child acquires some of these elements of the grammatical system lexically. The child may learn a grammatical form only as part of a frozen phrase and due to lack of patterns in the input not be able to progress to schematising and analogising in order to generate the grammatical form in other lexical contexts as part of systematic language. For some children, this may be reinforced and perhaps even extended later in formal education. However, even this partial lexical learning is under threat as, based on the results of this study, the parent generation, appears to be often inconsistent in their incorporation of, for example, gender or case marking in even the most everyday phrases e.g. *an fhuinneog* / **an fuinneog* (the window); *sa bpoll* / **sa poll* (in the hole).

6.4.1.2 Minimal grammatical accuracy development between 3 and 6 years of age on those measures on which parents were consistent.

Even on measures on which parents are consistent and, as a result, on which a development with age towards the adult target was hypothesised, children's grammatical accuracy still does not seem to develop much with age. When the influence of other predictor variables is taken into account, relationships between Grammatical Accuracy and Age are very weak and suggest that improvement in this area between 3 and 6 years of age is minimal i.e. that children both increase their grammatical accuracy minimally and produce few new grammatical forms. The following are possible reasons for this minimal development.

As previously considered in the results section, children's performance appeared to be deteriorating with Age on some Grammatical Accuracy measures produced consistently in parents (e.g. adverbial complement clauses). On investigation this impression was found to be misleading. It was due to poor measure design rather than due to any real deterioration in children's ability to produce these grammatical constructions accurately. These measures were often conceived too broadly, encompassing too many different subtypes. The deterioration in these cases is likely to be because as Irish Input, Age and Maternal Education increase, children's productions of the relevant measures become more frequent and also more diverse, including more challenging subtypes. This, in fact, means that the process of acquisition of grammar continues, but that the children have not yet fully acquired those complex subtypes.

True slowing down of Grammatical Accuracy development may be partly due to the influence of change of proportion Irish input with Age. As noted in the Results chapter, when the influence of other independent variables including Proportion Irish Input Since Birth is taken into account the

relationship between Grammatical Accuracy and Age loses strength. In children who have high Irish Input (more than 78% Irish Input Since Birth) the proportion Irish Input usually decreases with Age (see Table 42 which presents change in input over time). This is probably due to increased exposure to groups of people outside the immediate family e.g. in educational or other social settings. This may result in incomplete language acquisition even in these children who receive high Proportion Irish Input Since Birth. Therefore, some Irish grammatical constructions may become fossilised in children's talk due to reduction of learning opportunities and change in social and psychological factors as English language input and use increases and gains status in the children's lives. An additional result of this increase in proportion of English input is that grammatical patterns from which children can acquire language are further broken down. Additionally, those children with low Irish Input (less than 70% Irish Input Since Birth) behave similarly to younger high Irish Input children in Grammatical Accuracy. This reduces the average Grammatical Accuracy for each age group and adds to the picture of minimal Grammatical Accuracy development between 3 and 6 years of age.

6.4.1.3 Considering inconsistency and minimal development after 3 years as symptoms of incomplete language acquisition or language attrition

It is possible that both the minimal development between 3 and 6 years in measures which are consistent in parents' language and also the presence of inconsistency in parents' language are primarily due to incomplete language acquisition or language attrition in the parent group. The connection between language acquisition, inconsistency and language change has been addressed in the literature (Lightfoot, 2007; 2010). Previous studies of the Irish language in *An Ghaeltacht* (e.g. Ó Curnáin, 2009; Lenoach, 2012) have found rapid language change and have viewed this as being driven by incomplete language acquisition and language attrition. It was therefore thought useful to investigate whether this study's findings also supported this view.

As shown in the Results chapter, inconsistency found in parents' language was in fact present and not just a false impression resulting from poor measure design. This finding leads us to wonder why parents' performance is inconsistent on these measures (and not on others). It is necessary to explore the reasons for the parent group failing to acquire (or acquiring and losing) particular structures consistently (both intra- and inter-individually) and succeeding in acquiring others consistently. Understanding what happened during the parent generation's language acquisition would be enlightening. Finally, the reason development of grammatical accuracy is minimal between 3 and 6 years in measures which are consistent in parents' language should be examined. In order to attempt to address these issues it is necessary to tease out what inconsistent measures have in common with other inconsistent measures and what consistent measures have in common with other consistent measures.

The parents' parents (themselves born from the 1920s up to the early 1960s) had a more consistent grammatical system (Ó Curnáin, 2007). Inconsistency in the parents' performance may be a symptom of incomplete acquisition (i.e. parents never having fully acquired particular forms) or of language attrition (Montrul, 2008). Later developing structures, i.e. structures acquired at an older age are found to be more vulnerable both to incomplete acquisition and to language attrition (Montrul 2008). If the inconsistency found in this study is indeed a symptom of incomplete language acquisition or language attrition then later developing structures would be more vulnerable to inconsistent performance than earlier developing structures. What we need to investigate is whether measures on which parents were inconsistent have characteristics of later developing structures in other languages. Further, it is necessary to investigate whether they are predicted to be later developing in studies of Irish language development in younger Irish speaking children. Measures on which parents were more inconsistent may also be the measures identified by the literature as likely to be later developing. Below, measures which were found to show inconsistent and consistent performance in the parents in this study are considered in light of

theories of order of development. Measures on which parents were inconsistent are compared to those on which they were consistent with regards to the aspects highlighted by these theories of order of development.

In general, measures on which parents were inconsistent were related to grammatical morphemes. Two major factors have been found to distinguish both between earlier and later developing grammatical morphemes in other studies and between many grammatical morphemes on which parents were consistent and inconsistent in this study: 1) the complexity of the system of rules and exceptions (Lieven, Pine and Dresner-Barnes, 1992) and 2) the continuum of communicative weight or value (communicative redundancy / necessity) (Tomasello, 2003). In the case of a minority of grammatical morphemes in the parents' language, consistency can be explained by other factors. Some were probably, due to their frequency in the input, acquired early by the process of lexical learning, e.g. dependent form of 'bí' (raibh/bhfuil) following a particle. Others may have been acquired early because they comprise initial mutation which may be triggered by phonology or ease of articulation e.g. 'san' rather than 'sa' preceding all nouns beginning with vowels.

6.4.1.4 The complexity of the system of rules and exceptions: one framework through which to consider consistent and inconsistent measures.

Comrie (1981) and Peters (1997) as cited in O'Toole (2009) classify languages in terms of their morphological complexity. Comrie (1981) considers morphological complexity along two continuums: the analytic-synthetic continuum, and agglutinating-fusional continuum. Peters (1997) adds to this system of classification, the degree of semantic fusion. The complexity of the grammatical morphemes affects how and when children acquire these morphemes (Lieven, Pine & Dressner-Barnes, 1992). This study considers the complexity of different grammatical morphemes in Irish thereby distinguishing between potentially earlier (less complex) and later developing (more complex) Irish grammatical morphemes. In so doing we

can determine whether the parent group is inconsistent on potentially later developing grammatical morphemes and consistent on potentially earlier developing grammatical morphemes so giving support to the theory that the beginning of incomplete acquisition in the community can be seen in this parent group.

The analytic-synthetic continuum refers to the number of morphemes per word. The more synthetic the language the greater the number of grammatical morphemes which can be combined in one word. This is not a distinguishing factor between parents' consistent and inconsistent structures. In Irish, only one grammatical morpheme can be added to nouns. For example, nouns inflected for gender (in the nominative case following an article e.g. *fuinneog*: window ; *an fhuinneog*: the window) or case (prepositional e.g. *crúsca*: jug/jar; *sa gcrúsca*: in the jug/jar and genitive e.g. *an aill*: the cliff; *faoi bhun na haille*: under the cliff) only added one morpheme to the base and were found to be inconsistently produced across parents. Other nouns inflected for case (nouns inflected for possession e.g. *cloigeann*: head; *a chloigeann*: his head) or number (plural nouns e.g. *frog*: frog; *frogannaí*: frogs) also only added one morpheme, but were found to be consistently produced across parents. Similarly, usually only one grammatical morpheme is added to verbs. In some cases, however, verbs are inflected for number, person and tense (e.g. first person plural future *déanfaimid*: we will do/make). Parents were also consistent in their production of these highly inflected verbs.

The agglutinating-fusional continuum refers to the phonological segmentability of morphemes. Languages which are more agglutinative express morphemes by affixes which do not become fused to the base of the word and are therefore relatively easily segmentable by children acquiring language (Peters, 1997). In more fusional languages, affixes are fused with the base making them difficult to segment. Both the agglutinative and fusional method of combination of bases and grammatical morphemes is present in Irish. The grammatical morphemes on which parents were inconsistent are combined with the base through, for example, phonological

fusion in the case of initial mutations (*fuinneog*: window ; *an fhuinneog*: the window) and, for example, complete change of the base in the dependent form of the verb *bí* (as noted in the Introduction *tá*: present tense of the verb to be (*bí*); *áit a bhfuil x*: the place where x is). On the other hand, parents are found to be consistent on grammatical morphemes combined with the base both through agglutinative methods (e.g. future tense marking of verbs, *déan*: make/do; *déanfaidh*: will make/do and plural marking of nouns, *beach*: bee ; *beacha*: bees) and fusional methods (e.g. past tense lenition, *glaoigh*: to call; *ghlaoigh*: called; possessive case marking, *teach*: house; *a theach*: his house and plural marking of other nouns *créatúr*: creature/poor thing ; *créatúir*: creatures/poor things).

Peters (1997) also considered the degree of semantic fusion (or the number of meanings per affix) as a factor in morphological complexity: the more meanings combined in a single affix the more morphologically complex it is and the more difficult it is to acquire that affix. In Irish, single affixes do not generally combine different meanings. It could be argued that an exception is found in tense, number and person combined in present tense first person plural verb affixes (e.g. *rith*: run; *rithimid*: we run). Equally, these could be argued to be separable in speech (ə and ‘mid’) although less so in orthography. However, single grammatical affixes often represent different meanings in different contexts. An example of this is that depending on word class and syntactic context, lenition can indicate, among other things, gender, tense or case (possessive, prepositional and genitive). In this study, for example, the grammatical affixes on which parents were inconsistent often represented different meanings in different contexts (e.g. lenition in gender marking of feminine nominative case nouns following the article and genitive case marking of masculine nouns following the article). The same was, however, true for those on which parents were consistent (e.g. lenition in past tense marking; third person masculine possessive case marking, prepositional case marking).

Peters' (1997) and Comrie's (1981) classification of morphological complexity do not give us sufficient understanding of why parents were consistent on particular structures and inconsistent on others.

However, Thomas and Gathercole (2007) maintain that a very complex system of grammatical gender and mutation in Welsh is the reason it has not yet been acquired by nine year old native Welsh speaking children. Complexity here particularly refers to the opacity of the structures that is the complexity of their form-function mapping. For example, the expression of grammatical gender in Welsh is 'unavailable' (in that not all feminines show mutation) and 'unreliable' (in that there is no clear one-to-one relation between form and function) (Gathercole, 2007, p.234). Similarly complex grammatical systems are also found in Irish. Exceptions are a hallmark of these complex grammatical systems. For example, even in traditional Irish, nouns sometimes undergo initial mutation in the prepositional case and sometimes do not. This is dependent on which preposition is used and also on the initial sound of the noun itself. Table 8 presented in the Introduction Chapter illustrates the complexity of this particular system.

Further, the inclusion of unintegrated English words adds to the complexity of the system. In general, English words used by parents in this study were not integrated into the Irish grammatical mutation system. Unintegrated English words result in a further breakdown of whatever patterns were present. In this study, parents' performance on prepositional case inflection was, in comparison to traditional Irish, inter- and often intra-individually inconsistent. Some of the parents used prepositional case inflection in all obligatory contexts. Most of the parents' use of prepositional case inflection in obligatory contexts was very inconsistent. The inconsistency in these parents' use of inflection had little pattern across the range of prepositions which triggered inflection in traditional Irish. In the contexts in which prepositions did not trigger inflection in Traditional Irish, the parents did not use inflection either.

Some grammatical systems in Irish are simpler, for example, the future tense. In regular verbs, the future tense is communicated by suffixing a morpheme to the root. The form of this future tense morpheme depends on the conjugation of the verb. In the case of verbs in the first conjugation, *f(a)idh* is suffixed to the root e.g. *déan* – *déanfaidh*. In the second conjugation, *(a)igh* is omitted from the root and *(e)oidh* is suffixed e.g. *bailigh* - *baileoidh*. There are also 11 irregular verbs. The future tense in irregular verbs is acquired lexically. In this study, parents' performance on future tense in regular verbs was found in general to be intra- and inter-individually consistent.

6.4.1.5 Communicative Weight or Value: a framework through which to consider consistent and inconsistent measures

As noted in Chapter 3, communicative weight or value refers to ‘the relative contribution a form makes to the ... meaning of an utterance is based on the presence or absence of two features: inherent semantic value and redundancy within the sentence utterance’ (VanPatten, 1996, p.24). The grammatical morpheme ‘ing’ is an English language example with high communicative value because it has inherent semantic value and because ‘it is seldom redundant in naturally occurring discourse since more often than not no lexical information in the utterance co-occurs to provide cues to aspect.’

In VanPatten's (1996) research on listeners' attention, he found that language learners ‘prefer processing more meaningful morphology before less meaningful morphology’ (p.24). Based on this empirically supported conclusion, VanPatten said that ‘for learners to process form that is not meaningful’ (i.e. form that doesn't have semantic value) ‘they must be able to process informational or communicative content at no or little cost to attentional resources’ (p.27) and predicted that ‘grammatical forms of little or no communicative value will be processed much later in learners' development and subsequently will be acquired much later than other grammatical forms.’ (p.27) Similarly, Tomasello (2003) viewed acquisition

of some grammatical morphemes as being problematized by, among other factors, their lack of communicative weight. Those grammatical elements with lower communicative weight seem to be later developing whereas those grammatical elements with higher communicative weight or in other words those which are communicatively more necessary seem to be earlier developing. Grammatical elements with communicative weight come before those with mostly grammatical function.

For example, in English, the grammatical morpheme ‘ing’ (progressive) is acquired before ‘s’ (third person present), and ‘ed’ (past tense) is acquired after ‘ing’ and before ‘s’ (VanPatten 1984a). ‘ing’ may be acquired first because it is syllabic and therefore perceptually more salient in the input however there is usually no such structural distinction between ‘ed’ and ‘s’ – both are, generally, verb-final, consonantal and non-syllabic. Similarly, in the acquisition of Spanish, person-number inflections are generally acquired before markings of adjective concordance. It seems that relative communicative weight or value is relevant to order of acquisition in addition to structural features (VanPatten, 1984a; 1985b).

In this study, those grammatical morphemes on which parents were inconsistent, generally had lower communicative weight or in other words were more communicatively redundant than those on which parents were consistent. For example, gender marking which, in Irish, has low communicative weight, is used inconsistently by parents in this study and initial mutation marking possession in the third person singular which has high communicative weight is used consistently by parents.

6.4.1.6 Complexity, communicative weight and other studies of Irish language development

As noted in the introduction, data on grammatical accuracy development in Irish, past the age of three years, is sparse. Those grammatical morphemes acquired by age 3 generally have relatively simple systems and have relatively high communicative weight. O Toole (2009) investigates the

acquisition of six regular morphemes. These were found to be almost acquired by three year olds, so, relatively early developing. Of these six, five were included in this study. Not included was the synthetic verb and person marking e.g. téim rather than téann mé for ‘I go’ because 1) there was little opportunity for present tense first person forms in this narrative task and 2) this is rarely used by children in the Connemara dialect.

Regular Past tense lenition

Regular Plural marking

Ag

Possessive Marking lenition

Future tense

All five of these were found to be consistently produced by parents.

In the literature on Irish language acquisition, there has been little investigation of the development of grammatical accuracy in older preschool and school age children, however, two studies (Brennan, 2004 and Ó Baoill, 1992) give an indication of what morphophonemic initial mutation might be like in older children. Based on longitudinal data from two children, Ó Baoill suggested a possible pattern of development of the morphophonemic initial mutations found in Irish. In his data, he found that lenition appeared at about 21 months and increased in all appropriate contexts until it was used more consistently at 26 months. He did not attempt to make a more accurate or specific prediction based on only two participants. Brennan’s (2004) data for three children indicated a later emergence of both lenition and eclipsis with none at all present until after 25 months. Of particular note, in her further data on the older language production of a total of 7 children, she found that these initial mutations appear and increase after 26 months but overgeneralisations still remain in the data of three and a half year olds (data from the oldest child collected in this study). Neither study distinguishes between morphophonemic initial mutation in different contexts in its conclusions and therefore we only have an indication of a broad measure: morphophonemic initial mutation in

general. However, in light of the findings of O Toole's (2009) study, (i.e. that lenition marking possession and regular past tense were almost acquired by 3 year olds) we can, by a process of elimination, surmise that the morphophonemic initial mutations which result in the remaining inconsistency in 3 and a half year olds' productions in Brennan's study are those which present with a combination of relatively high grammatical complexity and low communicative weight.

6.4.1.7 Summary

Grammatical constructions inconsistently produced by the parent group are generally more complex and have lower communicative weight than those which are consistently produced by the parent group. These factors distinguish between earlier and later developing constructions in other languages. Further, available studies of L1 Irish language development indicate that grammatical constructions on which parents are consistent in this study are earlier developing and those on which parents are inconsistent are later developing. So it can be said that measures on which parents are consistent have characteristics of earlier developing structures and the measures on which parents are inconsistent have characteristics of later developing structures. This profile of consistency and inconsistency is a sign of incomplete language acquisition or language attrition in the parent generation (Montrul, 2009).

The minimal development of grammatical accuracy between 3 and 6 years of age in the child group is also likely to be primarily due to language change in *An Ghaeltacht*. Those grammatical constructions which are consistent in the parents were mostly acquired by 3 or 4 years of age (e.g. Past Tense 'bí' Lenition) by the child group and therefore little or no progression is evident in older age groups for these measures. Adding to this lack of progression is that those grammatical constructions which were not acquired by 3 or 4 years of age in children were not yet fully acquired by the oldest age group of children in this study either. Finally, those grammatical constructions produced inconsistently by the parent group, which in

Traditional Irish would have been later developing, may not be acquired by today's children at all. This is, however, not yet clear as further research needs to be done with older children to investigate this.

6.5 Summary of implications for language planning in *An Ghaeltacht*

Our findings support conclusions of previous studies (Ó Curnáin, 2009; Lenoach, 2012) which have identified language change in *An Ghaeltacht* driven by incomplete language acquisition and language attrition. The parent group in this study shows clear signs of incomplete language acquisition or language attrition and the influence of this is seen in the language acquisition of the child group.

Our findings also support the conclusions of previous studies (Pearson et al., 1997; Vihman et al., 2006) that in order to develop their minority language at a similar rate to monolinguals, bilingual children appear to need a greater proportion of their input in the minority language than in the majority language. In this study, children whose parent reports estimate below 70% Irish Input Since Birth develop at a slower rate in Irish Multi-clause Syntax, Verb Vocabulary and Grammatical Accuracy than peers who have a higher proportion (78% or above) Irish Input Since Birth. Even children who were reported to have had more than half of their input since birth in Irish (50-70%) developed slower particularly in many Grammatical Accuracy measures, than the average rate of children with higher Irish input (78%+). Slower development makes the Irish language acquisition of children with lower Proportion Irish Input Since Birth particularly vulnerable to incomplete language acquisition. The vulnerability of Irish language acquisition should be kept in mind in language planning.

6.6 Summary of implications for clinical practice

Clinicians should be aware of the vulnerability of the acquisition of a minority language. For a minority language the input threshold for development similar in rate to a monolingual (at least in Grammatical

Accuracy and Multi-Clause Syntax) is likely to be greater than a measure of 50%. This should be taken into account when helping parents to facilitate language development in their children.

An assessment framework

With regard to assessment of children's L1 acquisition of a minority language in bilingual contexts, it is necessary a) to measure the child's language production, b) to measure the proportion of quantity of input in each language since birth and, c) when possible, to maintain an up-to-date record of quality of input across the typical parent group.

Included in this assessment framework are the following:

- Procedures standardised on the relevant population. We know that some three and four year olds did not cooperate fully with the narrative procedure and that all five and six year olds did. Children and parents generally told stories in a natural way and parents generally completed questionnaires including useful and relevant information and returned them.
- Clinically useful measures of input and of language production across domains. As noted in the Introduction, in the face of the potential for such different language input across the group of bilingual minority language children it was questioned whether it would be possible to find language measures, especially measures of Grammatical Accuracy, which develop with age across children (and which therefore potentially distinguish between typically developing and language impaired peers). The results of this study show that this is indeed possible. Measures of Productivity, Multi-Clause Syntax and Verb Vocabulary which show development with age were identified. During the process of analysis there was initial doubt regarding the presence of a relationship between age and Grammatical Accuracy but as the quality and quantity of input were taken into account, clinically useful measures of Grammatical

Accuracy were also identified i.e. measures of Grammatical Accuracy that develop with age. Grammatical constructions parents produced consistently and which could therefore be used for the assessment of child language were identified. In these cases i.e. when the quality of grammatical input was consistent, the effects of age and quantity of input were evident.

The specificity (the ability of a measure to identify typically developing children) of Grammatical Accuracy as a measure of language acquisition and its sensitivity (the ability of a measure to identify atypically developing children) are dependent on the input being sufficiently investigated. For example, if a measure is acquired by the group of 3 year olds with high Proportion Irish Input Since Birth then if we are presented with an older child who is having difficulty with these, their Proportion Irish Input Since Birth should be investigated to decide whether the reason for the difficulty lies in a lack of Irish language input or in the child's language learning ability. Grammatical Accuracy becomes a less sensitive measure, however, as children grow older. It seems that many children with language difficulty (at least mild language difficulty) at 6 years of age would perform similarly in Grammatical Accuracy as children with typical language development at 6 years as they have had time to catch up with their peers whose rate of development has slowed down considerably. For children at approximately 3 or 4 years of age, it may be a more useful measure as the gap between typical and language impaired children is likely to be more noticeable.

- Summary statistics in relation to language measures allow comparison of children's performance to age categorised norms for the purpose of clinical assessment.

The assessment framework and the resource of time in the clinical context.

The complete version of this assessment framework (including the measurement and analysis of language production and quality and quantity

of language input) is suitable for a time rich clinical context such as a language class (a special class for children with Specific Language Impairment within a mainstream school) setting or similar where there is more time for collecting and analysing data. Further, in the clinical context, particularly small numbers of obligatory contexts for particular grammatical constructions in children's narratives may necessitate further investigation of these, following completion of this assessment framework, in order to clarify results and conclusions regarding the child's language development. This is realistic in time rich contexts but not in time poor contexts. Relatively limited time constraints in Primary care SLT services and similar mean that the use of the full assessment framework may not be realistic for every child. In these contexts, particular attention can be paid to Productivity measures: a child's single narrative can be recorded and analysed for these measures alone. Productivity measures were found to develop primarily with age and to be quite independent of input measures at least at this age and level of cumulative exposure. Productivity measures can therefore be considered quite useful preliminary measures when it is not realistic to access detailed knowledge of the quantity and quality of Irish input. Either the complete or reduced version would be useful for tracking progress in a child's language development. The knowledge of typical Irish language development gained from this study is relevant and helpful in both time rich and time poor contexts as a yardstick for clinical judgement of childrens language even independent of the assessment framework.

Limitations for clinical practice

This assessment framework is quite time consuming whether used in full or just for investigating language productivity. Also this assessment framework cannot yet be used for diagnosis of the presence of a language impairment as it has not been confirmed whether it distinguishes between language impaired and typically developing children or not.

6.7 Areas for future research

An assessment which facilitates reaching a diagnosis of language impairment and which can be completed in a single session (with a detailed questionnaire on input in each language being completed by parents at home) would be of great practical benefit to speech and language therapy practice for Irish speaking children. The next step towards this goal is to use information gathered in this study to create a shorter and more focused assessment based on the performance of a larger sample size. The plan is to incorporate, in a short focused assessment, those grammatical accuracy measures consistently produced by the parent group and about which we have an indication of age of acquisition. Relatively short sentence repetition tasks (20-30 sentences) have been shown to successfully distinguish between children with and without language impairment (for a review see Marinis, 2015). When sentences comprise familiar vocabulary and are long enough to disallow passive copying, children's ability to repeat sentences is primarily dependent on their grammatical and memory systems (Marinis, 2015; [Polišenská](#), Chiat & Roy, 2015). Children need to understand the sentence's meaning and then reproduce this meaning from representations of the grammatical constructions and words in long term memory (Potter & Lombardi, 1998). This means that children are not able to repeat these long sentences if they have not yet acquired the specific structures included in them (Marinis, 2015). Further, qualitative error analysis of the children's repeated sentences can give very useful information on the cause of breakdown and thereby facilitate intervention planning (Marinis, 2015).

References

- Adhmhaidin* (2010 October) (Radio programme). Galway, Raidió na Gaeltachta.
- Adler, S. (1991). Assessment of language proficiency of limited English proficient speakers: Implications for the Speech–Language Specialist. *Language, Speech, and Hearing Services in Schools*, 22, 12–18.
- Ambridge, B. & Lieven, E.V.M. (2011). *Child Language Acquisition: Contrasting Theoretical Approaches*. Cambridge University Press.
- Amato, P.R. (1993). Urban-rural differences in helping friends and family members. *Social Psychology Quarterly*, 56, 249-262.
- American Speech-Language-Hearing Association. (1985). Clinical management of communicatively handicapped minority language populations. *ASHA*, 27, 3-7.
- Armor, D.J. (2001). On family size and intelligence. *American Psychologist*, 56, 521-522.
- Arriaga, R. J., Fenson, L., Cronan, T., and Pethick, S. J. (1998) Scores on the MacArthur Communicative Development Inventory of children from low- and middle-income families. *Applied Psycholinguistics*, 19, 209-223.
- Atherton, J. S. (2013). *Doceo; Language Codes*. Retrieved 23 March 2015 from http://www.doceo.co.uk/background/language_codes.htm
- Barrière, I., Blum, Y., Gillig, L. and Meisels, M. (2011, July). Effects of quantity and quality of input and of language contact in heritage language learners: Insights from the acquisition of Yiddish by Hasidic toddlers. Paper presented at the 12th International Congress for the Study of Child Language (IASCL), Montreal, Canada.
- Bates, E., Camaioni, L., & Volterra, V. (1975). The acquisition of performatives prior to speech. *Merrill-Palmer Quarterly*, 21(3), 205-226. reprinted in A. Kasher, Ed., *Pragmatics: Critical concepts* (pp. 274-295) London: Routledge.
- Bates, E., Devescovi, A. & Wulfeck, B. (2001). Psycholinguistics: A cross-language perspective. *Annual Review of Psychology*, 52, 369-396.
- Bates, E. (2004). Explaining and interpreting deficits in language development across clinical groups: Where do we go from here? In B. Wulfeck & J.S. Reilly, (Eds.), *Plasticity and development: Language in atypical children*. Special issue, *Brain and Language*, 88(2), 248–253.

Appendices

- Bedore, L.M. & Pena, E.D. (2008). Assessment of bilingual children for identification of language impairment: current findings and implications for practice. *International Journal of Bilingual Education and Bilingualism*, 11(1) 1-29.
- Behrens, Heike (2006). The input-output relationship in first language acquisition. *Language and Cognitive Processes*, 21, 2-24.
- Bennett-Kastor, T. (1999). Predications and nonreferential cohesion in Irish-speaking children's narratives. *Functions of Language*, 6(2), 195-241.
- Berglund, E., Eriksson, M. and Westerlund, M. (2005). Communicative skills in relation to gender, birth order, childcare and socioeconomic status in 18 month old children. *Scandinavian Journal of Psychology*, 46. 485-491.
- Berkowitz, C. (2000). *Pediatrics: A Primary Care Approach*. Elsevier Health Sciences.
- Berman, R. A., & Slobin, D. I. (1994). *Relating events in narrative: A crosslinguistic developmental study*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bernicot, J., & Roux, M. (1998). La structure et l'usage des énoncés : comparaison d'enfants uniques et d'enfants seconds-nés. In J. Bernicot, H. Marcos, C. Day, M. Guidetti, V. Laval, J. Rabain-Jamin & G. Babelot (Eds.), *De l'usage des gestes et des mots chez l'enfant*. (pp. 157-178). Paris: A. Colin.
- Bernstein, B. (1970). Postscript. In *Talk reform. Explorations in language for infant school children*. In D.M. Gahagan and G.A.Gahagan (Eds.), (pp. 115-117). London: Routledge & Kegan Paul.
- Bialystok, E. (Ed.) (1991). *Language processing in bilingual children*. London: Cambridge University Press.
- Bialystok, E. and Hakuta, K. (1994). *In other words: The psychology and science of second language acquisition*. New York: Basic Books.
- Blake, J. (1981). Family Size and the Quality of Children. *Demography*, 18: 421-42.
- Blom, E. (2010). Effects of input on the early grammatical development of bilingual children. *International Journal of Bilingualism*, 14, 422-446.
- Bodovski, K. and Farkas, G. (2008). 'Concerted cultivation' and unequal achievement in elementary school. *Social Science Research*, 37, 903-19.
- Bornstein, M. H. and Haynes, O. M. (1998). Vocabulary competence in early childhood: Measurement, latent construct, and predictive validity. *Child Development*, 69, 654-671.
- Bornstein, M.H., Leach D.B. and Haynes, O.M. (2004). Vocabulary competence in first and secondborn siblings of the same chronological age. *Journal of Child Language*, 31, 855-873.

Appendices

Botting, N. (2002). 'Narrative as a tool for the assessment of linguistic and pragmatic impairments.' *Child Language Teaching & Therapy*, 18(1), 1 – 21.

Boudreau, D. M., & Hedberg, N. L. (1999). 'A comparison of early literacy skills in children with specific language impairment and their typically developing peers.' *American Journal of Speech-Language Pathology*, 8, 249 – 260.

Brennan, S. (2004). *First Steps: Early development of Irish as a primary language; focus on phonology: Na chéad chéimeanna: Luathfhorbairt Gaeilge mar phríomhtheanga; díriú ar an bhfóneolaíocht*. Baile Átha Cliath: Chomhdháil Náisiúnta na Gaeilge.

Brown, R. (1973). *A First Language: The Early Stages*. London: George Allen and Unwin.

Bussey, K. and Bandura, A. (1999). Social-cognitive theory of gender development and differentiation. *Psychological Review*, 106, 676–713.

Caesar, L. G. and Kohler, P. D. (2007). The state of school-based bilingual assessment: Actual practice versus recommended guidelines. *Language, Speech, and Hearing Services in Schools*, 38, 190-200.

Cameron-Faulkner, T. and Hickey, T. (2008). The functional basis of children's early multiword constructions: evidence from Irish and English Child-Directed Speech. In XI International Congress for the Study of Child Language, IASCL, Edinburgh, Scotland.

Cameron-Faulkner, T. and Hickey, T. (2011) Form and function in Irish child directed speech. *Cognitive Linguistics*, 22(3), 569-594.

Casielles, E., J. Andruski, S. Kim, G. Nathan and R Work (2006). Syntactic and discourse features of subjects in child Spanish: Evidence from Spanish/English bilingual acquisition. *Proceedings of the 30th Boston University Conference on Language Development*. Somerville, MA.: Cascadilla Press.

Chafe, W. (Ed.). (1980). *The Pear stories: Cognitive, cultural, and linguistic aspects of narrative production*. Norwood, NJ: Ablex.

Cheadle, J. E. and Amato, P. R. (2011). A quantitative assessment of Lareau's qualitative conclusions about class, race, and parenting. *Journal of Family Issues*, 32(5), 679-706.

Cheshire, J. (2004) Sex and Gender in Variationist Research. In J.K. Chambers, P. Trudgill and N. Schilling-Estes, (Eds.) *The Handbook of Language Variation and Change*, (pp. 423-443). Malden, MA: Blackwell.

Chomsky, N. (1981). *Lectures on Government and Binding*. Dordrecht: Foris.

Appendices

- Comrie, B. (1981). *Language Universals and Linguistic Typology: Syntax and Morphology*. Chicago: University of Chicago Press.
- Cordero, Kelly, Cordero, K.N. & Kohnert, K., (2006). Home support for English language learners with communication disorders: *California Speech-Language-Hearing magazine*, 36(2). 5-18.
- Cornips, L., & Hulk, A. (2006). External and internal factors in bilingual and bidialectal language development: Grammatical gender of the Dutch definite determiner. In C. Lefebvre, L. White and C. Jourdan (Eds.), *L2 Acquisition and Creole Genesis. The Montreal Dialogues* (pp. 355–377). Amsterdam and Philadelphia, PA: John Benjamins.
- Crutchley, A. (1999). Bilingual children with SLI attending language units: getting the bigger picture. *Child Language Teaching and Therapy*, 15(3) 201-217.
- Cummins, J. (1979). Cognitive/academic language proficiency, linguistic interdependence, the optimum age question and some other matters. *Working Papers on Bilingualism*, 19, 121-129.
- Cummins, J. (2000). *Language, power, and pedagogy: Bilingual children in the crossfire*. Clevedon, England: Multilingual Matters.
- Curtiss, S. (1977). *Genie: A Psycholinguistic Study of a Modern-Day "Wild Child"*, Boston, MA: Academic Press.
- Curtiss, S. (1989). *The case of Chelsea: A new test case of the critical period for language acquisition*. Manuscript, University of California, Los Angeles.
- De Bhaldraithe, T. (1977). *Gaeilge Chois Fhairrge: an deilbhíocht*. Baile Átha Cliath: Institiúid Árd-Léinn Bhaile Átha Cliath.
- De Houwer, A. (2007). Parental language input patterns and children's bilingual use. *Applied Psycholinguistics*, 28 411-424.
- Deuchar, M. (2007). Real life language practices in the home: observations and reported use. In V.C.M. Gathercole (Ed.), *Language Transmission in Bilingual Families in Wales*. Bangor, Wales: Welsh Language Board.
- Dollaghan, C. A., Campbell, T. F., Paradise, J. L., Feldman, H. M., Janosky, J. E., Pitcairn, D. L., and Kurs-Lasky, M. (1999). Maternal education and measures of early speech and language. *Journal of Speech, Language, and Hearing Research*, 42, 1432-1443.
- Domínguez, L. (2009). Charting the route of bilingual development: contributions from heritage speakers' early acquisition. *International Journal of Bilingualism*, 13 (2), 271-287.
- Dressler, W.U. (1996). Language death. In R. Singh (Ed.), *Towards a Critical Sociolinguistics*, (pp. 195-210) Amsterdam: Benjamins.

Appendices

- Dunn, J., & Shatz, M. (1989). Becoming a conversationalist despite (or because of) having an older sibling. *Child Development*, 60, 399-410.
- Duquette, G. 1991. Cultural processing and minority language children with needs and special needs. In Malavé, L. and Duquette, G. (Eds). 1991. *Language, Culture and Cognition*. Clevedon: Multilingual Matters.
- Durán, P., Malvern, D., Richards, B. and Chipere, N. (2004). Developmental trends in lexical diversity. *Applied Linguistics*, 25(2), 220-242.
- Eckert, Penelope (2000). *Linguistic Variation as Social Practice*. Oxford: Blackwell.
- Edwards, S., Fletcher, P., Garman, M., Hughes, A., Letts, C. and Sinka, I. (1997) The *Reynell Developmental Language Scales: III (RDLS-III)*. London: NFER-NELSON.
- Elman, J.L. (2003). Development: It's about time. *Developmental Science*, 6, 430-433.
- Ensminger, M. E., & Fothergill, K. (2003). 'A decade of measuring SES: What it tells us and where to go from here.' In M. H. Bornstein & R. H. Bradley (Eds.), *Socioeconomic Status, Parenting and Child Development*. Mahwah, NJ: Lawrence Erlbaum.
- Eriksson, M., and Berglund, E. (1999). Swedish early communicative development inventories: words and gestures. *First Language*, 19, 55-90.
- European Charter for Regional or Minority Languages 1992* (Eur).retrieved 2 April 2013 from <http://www.refworld.org/docid/3de78bc34.html> .
- Feldman, H. M., Dollaghan, C. A., Campbell, T. F., Kurs-Lasky, M., Janosky, J. E., Paradise, J. L. (2000). Measurement properties of the MacArthur Communicative Development Inventories at ages one and two years. *Child Development*, 71(2), 310-322.
- Fenson, L., Dale, P. S., Reznick, J. S., Bates, E., Thal, D. J., and Pethick, S. J. (1994). Variability in early communicative development. *Monographs of the Society for Research in Child Development*, 59(5).
- Fey, M. E., Catts, H. W., Proctor-Williams, K., Tomblin, J. B., and Zhang, X. (2004). Oral and written story composition skills of children with language impairment. *Journal of Speech, Language, and Hearing Research*, 47, 1301–1318.
- Fiestas, C. E. and Peña, E.D., (2004). Narrative Discourse in Bilingual Children: Language and Task Effects. *Language, Speech and Hearing Services in Schools*, 35, 155-168.
- Finlay, L. & Gough, B. Eds (2003). *A Practical Guide for Researchers in Health and Social Sciences*. Oxford: Blackwell Science Ltd.

Appendices

- Gathercole, V. C. M. (2002). Command of the mass/count distinction in bilingual and monolingual children: An English morphosyntactic distinction. In D. K. Oller & R. E. Eilers (Eds.), *Language and literacy in bilingual children* (pp.175-206). Clevedon: Multilingual Matters.
- Gathercole, V. C. M. (2007). Miami and North Wales, so far and yet so near: Constructivist account of morpho-syntactic development in bilingual children. *International Journal of Bilingual Education and Bilingualism*, 10 (3), 224-247.
- Gathercole, V. C. M. and Hoff, E. (2007). Input and the acquisition of language: Three questions. In E. Hoff & M. Shatz (Eds.), *The Handbook of Language Development* (pp.107-127) New York: Blackwell Publishers.
- Gathercole, V. C. M. and Thomas, E. M. (2005). Minority language survival: Input factors influencing the acquisition of Welsh. In J. Cohen, K. McAlister, K. Rolstad, & J. MacSwan (Eds.): *ISB4: Proceedings of the 4th International Symposium on Bilingualism* (pp. 852-874) Somerville, MA: Cascadilla Press.
- Gathercole, V. C. M. and Thomas, E. M. (2009). Bilingual first language development: dominant language takeover, threatened minority language take-up. *Bilingualism: Language and Cognition*, 12, 213-237.
- Gazella, J. and Stockman, I. J. (2003). Children's story retelling under different modality and task conditions: implications for standardizing language sampling procedures. *American Journal of Speech-Language Pathology*, 12, 61-72.
- Genessee, F.H. (2009). Early childhood bilingualism: perils and possibilities. *Journal of Applied Research on Learning*, 2(Special Issue), 1-21.
- Gleason, J. and Ely, R. (2002). Gender differences in language development. In A. V. McGillicuddy-De Lisi and R. De Lisi (Eds.), *Biology, Society, and Behavior. The Development of Sex Differences in Cognition*, 21. (pp. 127-154) Westport, CT: Ablex.
- Goldfield, B. and Reznick, J. S. (1990). Early lexical acquisition: Rate, content, and vocabulary spurt. *Journal of Child Language*, 17, 171-183.
- Goldstein, B.A. (2006). Clinical implications of research on language development and disorders in bilingual children. *Topics in Language Disorders*, 26 (4), 305-321.
- Goodluck, H., Guilfoyle, E., & Harrington, S. (2001). Acquiring subject and object relatives: evidence from Irish. *Journal of Celtic Language Learning*, 6, 21-33.
- Goodluck, H., Guilfoyle, E., & Harrington, S. (2006). Merging and binding in child relative clauses: the case of Irish. *Journal of Linguistics*, 42, 629-661.
- Grech, H. and Dodd, B. (2007). Assessment of speech and language skills in bilingual children: an holistic approach. *Stem-, Spraak- En Taalpathologie*, 15 (2), 84-92.

Appendices

- Guiberson, M., Barrett, K.C., Jancosek, E.G., and Yoshinaga-Itano, C. (2006). Language maintenance and loss in young preschool age children of Mexican immigrants: Longitudinal study. *Communication Disorders Quarterly*, 28, 4-14.
- Gutiérrez-Clellan, V.F. (1998). Syntactic skills of Spanish-speaking children with low school achievement. *Language, Speech & Hearing Services in Schools*, 29, 207-215.
- Gutiérrez-Clellan, V.F. (1999). Language choice in intervention with bilingual children. *American Journal of Speech and Language Pathology*, 8, 291-302.
- Gutiérrez-Clellan, V.F. and Kreiter, J. (2003). Understanding child bilingual acquisition using parent and teacher reports. *Applied Psycholinguistics*, 24, 267-288.
- Gutiérrez-Clellan, V., Restrepo, A. and Simon-Cerejido, G. (2006). Evaluating the discriminant accuracy of a grammatical measure with Spanish speaking children. *Journal of Speech and Language Research*, 49, 1209-1223.
- Hadley, P. (1998). Language sampling protocols for eliciting text-level discourse. *Language, Speech and Hearing Services in Schools*, 29, 132-147.
- Hale, K. (1992). Endangered languages: On endangered *languages* and the safeguarding of diversity. *Language*, 68 (1), 1-42.
- Hamann, C. (2004). Comparing the Development of the Nominal and the Verbal Functional Domain in French Language Impairment. In P. Prévost and J. Paradis (Eds): *The Acquisition of French*. Amsterdam: John Benjamin's.
- Hammond, P.D., Gold, M.S., Wigg, N.R. and Volkmer, R.E. (1997). Preschool hearing screening: evaluation of a parental questionnaire. *Journal of Paediatrics and Child Health*, 33 (6), 528-530.
- Hart, B. and Risley, T.R. (1992). American parenting of language-learning children: persisting differences in family-child interactions observed in natural home environments. *Developmental Psychology*, 28, 1096-1105.
- Hart, B. and Risley, T.R. (1995). *Meaningful Differences in the Everyday Experience of Young American Children*. Baltimore: Paul H. Brooke's Publishing Company.
- Hart, B. and Risley, T.R. (1999). *The Social World of Children Learning to Talk*. Baltimore: Paul H. Brooke's Publishing Company.
- Hayes, D. (2007). *An investigation of the narrative structure of monolingual Irish-speaking preschool children*. (Unpublished research project). National University of Ireland (NUI) Galway.
- Healy, J., Lyons, R., O'Malley, M.P. and Antonijevic, S. (2010). Preparing health care workers for a bilingual and multicultural context: learning from an undergraduate speech and language therapy programme. *Translocations*, 6 (1).

Appendices

- Heilmann, J. Miller, J.F., Iglesias, A. Fabiano-Smith, L. Nockerts, A. (2008). Narrative transcription accuracy and reliability in two languages. *Topics in Language Disorders*, 28 (2), 178-188.
- Henry, A. (1998). Dialect variation, optionality and the learnability guarantee. *Linguistica Atlantica*, 20, 51-71.
- Henry, A. (2002). Variation and Syntactic Theory. In J.K. Chambers, P. Trudgill and N. Schilling-Estes (Eds.) *The Handbook of Language Variation and Change*. (pp. 267-282). Oxford: Wiley-Blackwell.
- Hesketh, A. (2004). Grammatical performance of children with language disorder on structured elicitation and narrative tasks. *Clinical Linguistics & Phonetics*, 18(3), 161-82.
- Hickey, R. (1982). The phonology of English loan-words in Inis Meáin Irish. *Eriú*, 33. 137-156.
- Hickey, R. (2007). *Irish-English: Its History and Present-Day Forms*. Cambridge, U.K.: Cambridge University Press.
- Hickey, R. (2012). Internally and externally motivated language change. In Hernández-Compy, Juan Manuel and Juan Camilo Conde-Silvestre (eds) *The Handbook of Historical Sociolinguistics*. Malden, MA: Wiley- Blackwell, pp. 401-421
- Hickey, T. (1987). *The Early Acquisition of Irish: Grammatical Patterns and the Role of Formulas*. (Unpublished PhD dissertation). University of Reading.
- Hickey, T. (1990a). The acquisition of Irish: A study of word order development. *Journal of Child Language*, 17 (1), 17-41.
- Hickey, T. (1990b). ILARSP- a grammatical profile of Irish. *Clinical Linguistics and Phonetics*, 4, 363-376.
- Hickey, T. (1991). Mean length of utterance and the acquisition of Irish. *Journal of Child Language*, 18, 553-569.
- Hickey, T. (1992). The acquisition of Irish as a first language: what do we know? In D.P. Ó Baoill (Ed.), *Insealbhú na Gaeilge mar chéad teanga: the acquisition of Irish as a first language*. Dublin: Irish Association for Applied Linguistics.
- Hickey, T. (1993). Identifying formulas in first language acquisition. *Journal of Child Language*, 20, 27-41.
- Hickey, T. (2001). Mixing beginners and native speakers in Irish immersion: Who is immersing whom?. *Canadian Modern Language Review*, 57 (3), 443-474.

Appendices

- Hickey, T.M. (2007). Children's language networks and teachers' input in minority language immersion: What goes in may not come out. *Language and Education*, 21 (1), 46-65.
- Hindley, R. (1990). *The Death of the Irish Language: A Qualified Obituary*. Oxon: Routledge.
- Hocking, R. (2003). *Methods and Applications of Linear Models: Regression and the Analysis of Variance*. 2nd edition. New Jersey: John Wiley and sons Inc.
- Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development*, 74, 1368–1378.
- Hoff, E. (2005). *Language development*. Belmont, CA: Wadsworth/Thomson Learning.
- Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26, 55-88.
- Hoff-Ginsberg, E. (1991). Mother-child conversation in different social classes and communicative settings. *Child Development*, 62(4) 782-96.
- Hoff-Ginsberg, E. (1998). The relation of birth order and socioeconomic status to children's language experience and language development. *Applied Psycholinguistics*, 19, 603-629.
- Hoff-Ginsberg, E. and Krueger, W.M. (1991). Older Siblings as Conversational Partners. *Merrill-Palmer Quarterly*, 37 (3), 465-481.
- Hoff, E., Laursen, B. and Tardif, T. (2002) Socioeconomic Status and Parenting. In M.H. Bornstein, (Ed.) *Handbook of Parenting. Volume 2, Biology and Ecology of Parenting*. London: Lawrence Erlbaum Associates.
- Holm, A., Ozanne, A. and Dodd, B. (1997). Efficacy of intervention for a bilingual child making articulation and phonological errors. *International Journal of Bilingualism*, 1, 55-69.
- Howell, D. C. (2010). *Statistical Methods for Psychology 8th edition*. Belmont, CA: Wadsworth Cengage Learning.
- Hudson, R. (1997). Inherent variability and linguistic theory. *Cognitive Linguistics* 8(1) 73-108.
- Hunt, K. W. (1970). Syntactic maturity in school children and adults. *Monographs of the Society for Research in Child Development*, 35 (1) 1-67.
- Huttenlocher, J., Haight, W., Bryk, A., Seltzer, M. and Lyons, T. (1991). Early vocabulary growth: relation to language input and gender. *Developmental Psychology*, 27(2) 236-248.

Appendices

Huttenlocher, J., Vasilyeva, M. Cymerman, E. and Levine, E. (2002). Language input and child syntax. *Cognitive Psychology*, 45, 337-374.

Hyde, J. S. (1981). How large are cognitive gender differences? A meta-analysis using w^2 and d . *American Psychologist*, 36, 892-901.

Hyde, J. S. and Linn, M. C. (1988). Gender differences in verbal ability: A meta-analysis. *Psychological Bulletin*, 104, 53-69.

Iris Aniar (2009 November) (Radio programme). Galway, Raidió na Gaeltachta.

Irish Association for Speech and Language Therapists (IASLT). (2006). *Working with bilingual or multilingual clients*. Ireland: IASLT.

Jackson-Maldonado, D., Thal, D., Marchman, V., Bates, E. and Gutiérrez-Clellen, V., (1993). Early lexical development in Spanish-speaking infants and toddlers. *Journal of Child Language*, 20 (3):523-49.

Jefferson, G. (1984). Transcript notation. In J. Atkinson & J. Heritage (Eds.), *Structures of social interaction: Studies in conversation analysis* (pp. 134-162). Cambridge: Cambridge University Press.

Jones, C. and Adamson, L. B. (1987). Language use in mother-child and mother-child-sibling interactions. *Child Development*, 58, 356-366.

Jones, M.C. and Singh, I. (2005). *Exploring Language Change*. London, Routledge

Juarez, M. (1983). Assessment and treatment of minority language-handicapped children: The role of the monolingual speech-language pathologist. *Topics in Language Disorders*, 3, 57-65.

Kallen, J.L., (1996). Bilingualism and language disability in children: a sociolinguistic review, *Journal of Clinical Speech and Language Studies*, 6, 1996, 17-48.

Kallen, J.L. (2001). Preface: the acquisition of celtic languages. *Journal of Celtic Language Learning*, 6, 5-8.

Kallen, J. L. (2002/3). Bilingualism, language disability and linguistic human rights. *Journal of Clinical Speech and Language Studies*, 12/13, 147-172.

Kallen, J. L. and Smith, M., (1992). Irish Language Acquisition and Speech/Language Therapy: Principles and Needs. In D.P. Ó Baoill (Ed.), *Insealbhú na Gaeilge mar Chéad Teanga: the acquisition of Irish as a first language*. Dublin: Irish Association for Applied Linguistics.

Karrass, J., Braungart-Rieker, J.M., Mullins, J. & Lefever, J. B. (2002). Processes in language acquisition: the roles of gender, attention, and maternal encouragement of attention over time. *Journal of Child Language*, 29 (3), 519-43.

Appendices

Kayser, H. (1995). *Bilingual Speech-Language Pathology: an Hispanic focus*. Delmar Cengage Learning.

Keilthy, P. (2014). Maternal employment dynamics and children's social and emotional outcomes in the UK, Ireland and Denmark. [Oral Presentation], *Growing up in Ireland annual conference*, Dublin , 26-NOV-14 - 26-NOV-14.

Kern, S. and Gayraud, F. (2007). Influence of preterm birth on early lexical and grammatical acquisition. *First Language*, 27, 159-173.

Kohnert, K. and Derr, A. (2004). Language intervention with bilingual children. In B.A. Goldstein (Ed.) *Bilingual language development and disorders in Spanish-English speakers*. (p 311-339). Baltimore, MD: Paul H. Brookes Publishing Co.

Kohnert, K., Yim, D., Nett, K., Kann, P.F. & Duran, L., (2005). Intervention with linguistically diverse preschool children: a focus on developing home language(s). *Language, Speech and Hearing Services in Schools*, 36, 251-263.

Labov, (1972). *Sociolinguistic Patterns*, Philadelphia: University of Pennsylvania Press.

Lareau, A. (2003). *Unequal Childhoods: Class, Race and Family Life*. California: University of California Press.

Law, J., Todd, L., Clark, J., Mroz, M. and Carr, J. (2013). *Early Language Delays in the UK* London: Save the Children.

Leaper, C. and Smith, T.E. (2004). A meta-analytic review of gender variations in children's language use: talkativeness, affiliative speech and assertive speech. *Developmental Psychology*, 40 (6) 993-1027.

Lenoach, C. (2012). An Ghaeilge Iarthraidisiúnta agus a Dioscúrsa. In C. Lenoach, C. Lenoach, C., Ó Giollagáin, C and Ó Curnáin, B. (Eds) (2012). *An Chonair Chaoch: an Mionteangachas sa Dátheangachas*. Gaillimh: Leabhar Breac.

Leonard, L.B. (1998). *Children with specific language impairment*. Cambridge, MA: MIT Press.

Liben, L. S. and Bigler, R. S., (2002). The developmental course of gender differentiation. Conceptualizing, measuring, and evaluating constructs and pathways. *Monographs of the Society for Research in Child Development*, 67, (2) 6-95.

Lieven, E. V. M., Pine, J. M. and Dresner Barnes, H. (1992). Individual differences in early vocabulary development: redefining the referential-expressive dimension. *Journal of Child Language*, 19, 287-310.

Lightfoot, D.W. and Westergaard, M.R. (2007). Language acquisition and language change: inter-relationships. *Language and Linguistics Compass*, 1, 396-416.

Appendices

- Lightfoot, D. (2010). Language acquisition and language change. *Reviews: Cognitive Science*, 1 (5), 677-84.
- Liles, B. (1993). Narrative discourse in children with language disorders and children with normal language: A critical review of the literature. *Journal of Speech and Hearing Research*, 36, 868–882.
- Liles, B., Duffy, R., Merritt, D. and Purcell, S., (1995). Measurement of narrative discourse ability in children with language disorders. *Journal of Speech and Hearing Research*, 38, 415-425.
- Loban, W. (1976). *Language development : kindergarten through grade twelve*. Urbana, IL: National Council of Teachers of English.
- Lord, N.. (1996). *Native Tongues: The Languages That Once Mapped the American Landscape Have Almost Vanished.*, *Sierra*, 8 (16), 46-69.
- Malvern, D. D. and Richards, B. J. (2000). Validation of a New Measure of Lexical Diversity. In M. Beers, B. v. d. Bogaerde, G. Bol, J. de Jong and C. Rooijmans (eds), *From Sound to Sentence: Studies on First Language Acquisition*. (pp. 81-96) Centre for Language and Cognition, Groningen.
- Maccoby, E.E., (Ed.) (1966). *The Development of Sex Differences*. Stanford: Stanford University Press.
- Maccoby, E.E. and Jacklin, C.N. (1974). *The Psychology of Sex Differences*. Stanford: Stanford University Press.
- Macleroy Obied, V. (2009). How do siblings shape the language environment in bilingual families. *International Journal of Bilingual Education and Bilingualism*. 12 (6), 705-720.
- Maratsos, M. and Chalkley, M.A. (1980). The internal language of children's syntax: the ontogenesis and representation of syntactic categories. In K. Nelson (Ed.) *Children's Language*. 2 127-214 New York: Gardner.
- Maratsos, M. (2000). More overregularizations after all. *Journal of Child Language*, 27, 183-212.
- Marchman, V., & Bates, E. (1994). Continuity in lexical and morphological development: A test of the critical mass hypothesis. *Journal of Child Language*, 21, 339-366.
- Marinis, T. and Armon-Lotem, S. (2015). Sentence Repetition. In Armon-Lotem, S., de Jong, J. and Meir, N. (Eds.). *Methods for assessing multilingual children: disentangling bilingualism from Language Impairment*. Multilingual Matters.
- Martin, C.L., Ruble, D.N. and Szkrybalo, J. (2002). Cognitive theories of early gender development. *Psychological Bulletin* 128 (6) 903-33.

Appendices

Martin, C.L., and Ruble, D.N. (2004). Children's search for gender cues: Cognitive perspectives on gender development. *Current Directions in Psychological Science*, 13, 67-70.

Mayer, M. (1969). *Frog, Where are You?* New York: Dial Press.

McCloskey, J. (2008). Irish as a World Language. In B. Ó Conchubhair (Ed.), *Why Irish? Irish Language and Literature in Academia*. Galway: Arlen House.

McEnery, B., (2001). Qualitative vs Quantitative Analysis. In Wilson online notes : to supplement *Corpus Linguistics*. Edinburgh University Press. Retrieved April 10, 2014 from <http://www.sal.tohoku.ac.jp/ling/corpus3/3qual.htm>

Merritt, D. D. and Liles, B. Z. (1989). Narrative analysis: Clinical applications of story generation and story retelling. *Journal of Speech and Hearing Disorders*, 54, 438-47.

Mesthrie, R., Swann, J., Deumert, A., Leap, W.L. (2000). *Introducing Sociolinguistics*. Edinburgh: Edinburgh University Press.

Mikes, M. (2001). Sociolinguistic backgrounds of kindergarten children in bilingual settings. *International Journal of the Sociology of Language*, 151, 49-67.

Miller, N. (1984). Some observations concerning formal tests in cross-cultural settings. In N. Miller (Ed.) *Bilingualism and Language Disability: Assessment and Remediation*, 107-114. London: Croom-Helm.

Ministers and Secretaries (Amendment) Act, 1956 Section 2(2) (Ire).

Minister for Community, Rural and Gaeltacht Affairs (Powers and Functions) Act 2003 (Ire).

Montrul, S. (2008). *Incomplete acquisition in bilingualism: Re-examining the age factor*. Amsterdam: John Benjamins.

Montrul, S. (2009). Incomplete acquisition of tense-aspect and mood in Spanish heritage speakers. *The International Journal of Bilingualism*, 13 (3) 239-269.

Moore, D. S., McCabe, G.P. and Craig, B.A. (2012). *Introduction to the practice of statistics*. 7th international edition ed. New York: W.H. Freeman.

Ní Chionnaith, P. (2012). Loiceadh Córais: Léargas Tuismitheoirí ar an gCóras Oideachais sa Ghaeltacht. In C. Lenoach, C. Ó Giollagáin and B. Ó Curnáin, *An Chonair Chaoch: An Mionteangachas sa Dátheangachas*. Gaillimh: Leabhar Breac.

Nicoladis, E. and Genesee, F. (1997). Language development in preschool bilingual children. *Journal of Speech-Language Pathology and Audiology*, 21, 258-270.

Appendices

- Nippold, M.A., Hesketh, L. J., Duthie, J. K. and Mansfield, T.C. (2005). Conversational versus expository discourse: A study of syntactic development in children, adolescents and adults. *Journal of Speech, Language and Hearing Research*, 48, 1048-1064.
- Nippold, M.A., Mansfield, T.C. and Billow, J.L. (2007). Peer conflict explanations in children, adolescents and adults: examining the development of complex syntax. *American Journal of Speech-Language Pathology*, 16, 179-188.
- Noble, K.G., Norman, M.F. and Farah, M.J. (2005). Neurocognitive correlates of socioeconomic status in kindergarten children. *Developmental Science*, 8, 74-87.
- Norbury, C.F. and Bishop, D.V. (2003). Narrative skills of children with communication impairments. *International Journal of Language and Communication Disorders*, 38 (3), 287-313.
- Nuacht TG4* (2010 October). (Television programme). Galway, TG4.
- Ó Baoill, D. P. (1992). Developmental Stages in the Acquisition of Irish Phonology and Initial Mutations. In D.P. Ó Baoill (ed.) *Insealbhú na Gaeilge mar Chéad Teanga*. Dublin: Irish Association for Applied Linguistics.
- Ó Béarra, F. (2008). Late modern Irish and the dynamics of language change and language death. In Tristram, H.L.C. (Ed). *The Celtic Languages in Contact: Papers from the Workshop within the Framework of the XIII International Congress of Celtic Studies, Bonn, 26 - 27 July 2007*. (pp. 260-269). Berlin: Potsdam University Press.
- O'Brien, M., & Nagle, K.J. (1987). Parents' speech to toddlers: The effect of play context. *Journal of Child Language*, 14, 269-279.
- Ó Curnáin, B. (2007). *The Irish of Iorras Aithneach, County Galway*. Dublin: Dublin Institute for Advanced Studies.
- Ó Curnáin, B. (2009). Mionteangú na Gaeilge. In B. Ó Catháin (Ed.) *Sochtheangeolaíocht na Gaeilge: Léachtaí Cholm Cille 39*. (pp. 90-153) Maigh Nuad: An Sagart.
- Ó Giollagáin, C. (2012, August). From Revivalist to Undertaker: New developments in official policies and attitudes to Ireland's 'First Language'. Paper presented at the 19th Sociolinguistics Symposium, University of Berlin.
- Ó Giollagáin, C., Mac Donnacha, S., Ní Chualáin, F., Ní Sheaghda, A and O'Brien, M. (2007). *Staidéar cuimsitheach teangeolaíoch ar úsáid na Gaeilge sa Ghaeltacht: príomhthatal agus moltaí. Comprehensive Linguistic Study of the Use of Irish in the Gaeltacht* Dublin: Oifig an tSoláthair.
- Ó Giollagáin, C. and Mac Donnacha, S. (2008). The Gaeltacht Today. In C. Nic Phóidín and S. Ó Cearnaigh (Eds.) *A New View of the Irish Language*. (pp.108-120) Dublin: Cois Life.

Appendices

- Oller, D. K., and Eilers, R. E. (2002). *Language and Literacy in Bilingual Children*. Clevedon, UK: Multilingual Matters.
- Ó Murchú, H. (2001). The needs of Irish-speaking bilinguals. *Journal of Clinical Speech and Language Studies*, 11, 40-68.
- Ó Riagáin, P. (1997). *Language Policy and Social Reproduction: Ireland 1893-1993*. Oxford Studies: Clarendon Press.
- Ó Siadhail, M. (1989). *Modern Irish*. Cambridge University Press.
- Oshima-Takane, Y, Goodz, E. and Derevensky, J.L. (1996). Birth Order effects on Early language development: Do secondborn children learn from overheard speech? *Child Development*, 67, 621-634.
- Oshima-Takane, Y. and Robbins, M.(2003). Linguistic environment of secondborn children. *First Language*, 23, 21-40.
- O'Toole, C. (2009). *Sealbhú na Gaeilge ag Naíonáin: Early Language Acquisition of Irish*. (Unpublished doctoral thesis). University College Cork, Ireland.
- O'Toole, C. and Fletcher, P. (2007/8). Developing assessment tools for bilingual and minority language acquisition. *Journal of Clinical Speech and Language Studies*, 16, 12-27.
- O'Toole C. and Hickey, T. (2013). Diagnosing language impairment in bilinguals: professional experience and perception. *Child Language Teaching and Therapy*, 29 (1) 91-109.
- Ozcalskan, S. and Goldin-Meadow, S. (2010). Sex differences in language first appear in gesture. *Developmental Science*, 13 (5) 752-760.
- Page, E. B. and Grandon, G. M. (1979). Family configuration and mental ability: two theories contrasted with U.S. data. *American Educational Research Journal*, 16, 257-272.
- Parada, M., (2013). Sibling variation and family language policy: the role of birth order in the Spanish proficiency and first names of second-generation Latinos. *Journal of Language Identity and Education*, 12(5), 299-320.
- Paradis, J. (2007). Bilingual children with specific language impairment: Theoretical and applied issues. *Applied Psycholinguistics*, 28, 512-564.
- Paradis, J. and Genesee, F. (1996). Syntactic acquisition in bilingual children: Autonomous or interdependent? *Studies in Second Language Acquisition*, 18, 1-25.
- Paradis, J., Genesee, F., and Crago, M. (2011). *Dual language development and disorders: A handbook on bilingualism and second language learning* (2nd Edition). Baltimore, MD: Brookes.

Appendices

Paradis, J. and Navarro, S. (2003). Subject realization and crosslinguistic interference in the bilingual acquisition of Spanish and English: What is the role of the input? *Journal of Child Language*, 30(2), 371-393.

Paradis, J., Tremblay, A. and Crago, M. (2008). Bilingual children's acquisition of English inflection: The role of dominance and task type. In H. Chan, H. Jacob and E. Kapia, (Eds.), *BUCLD 32 Proceedings* (pp. 378-389). Somerville, MA: Cascadilla Press.

Paul, R. (2007). *Language Disorders from Infancy Through Adolescence: Assessment and Intervention*. Missouri: Mosby Elsevier.

Pearson, B. Z. (2007). Social factors in childhood bilingualism in the United States. *Applied Psycholinguistics*, 28 (3), 399-410.

Pearson, B. Z., Fernandez, S., Lewedag, V., & Oller, D. K. (1997). Input factors in lexical learning of bilingual infants (ages 10 to 30 months). *Applied Psycholinguistics*, 18, 41-58.

Pert, S. and Letts, C.A. 2003. Developing an expressive language assessment for children in Rochdale with a Pakistani heritage background. *Child Language Teaching and Therapy*, 19 (3), 266-289.

Peters, A. M. (1997) Language typology, prosody and the acquisition of grammatical morphemes. In D. I. Slobin (Ed.) *The Crosslinguistic Study of Language Acquisition*. Hillsdale NJ: Lawrence Erlbaum Associates.

Pétevráry, T. Ó Curnáin, B. Ó Giollagáin, C. and Sheahan, J. (forthcoming) *Iniúchadh ar an gCumas Dátheangach; An Sealbhú teanga i measc ghlúin óg na Gaeltachta. Analysis of Bilingual Competence; Language acquisition among young people in the Gaeltacht*. Dublin: An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta.

Pine, J. M. (1995). Variation in vocabulary development as a function of birth order. *Child Development*, 66, (1) 272-282.

Pires, A. and Rothman, J. (2009). Disentangling sources of incomplete acquisition: an explanation for competence divergence across heritage grammars. *International Journal of Bilingualism*, 13 (2) 211-238.

Place, S. and Hoff, E. (2011). Properties of dual language exposure that influence 2-year-olds' bilingual proficiency. *Child Development*, 82 (6)1834-49.

[Polišenská](#), K., Chiat, S. & Roy, P. (2015). Sentence repetition: what does the task measure? *International Journal of Language and Communication Disorders*, 50 (1), 106-18.

Potter, M. C. and Lombardi, L. (1998). Syntactic priming in immediate recall of sentences. *Journal of Memory and Language*, 38, 265-282.

Appendices

- Purcell, A. (1984). Code shifting Hawaiian Style: Children's accommodation as a decreolizing continuum. *International Journal of Sociology of Language*, 46 71-86.
- Reilly, J., Losh, M., Bellugi, U. and Wulfeck, B. (2004). "Frog, where are you?" Narratives in children with specific language impairment, early focal brain injury and Williams syndrome. *Brain and Language*, 88, 229-247.
- Reilly, S., Wake, M., Ukoumunne, O.C., Bavin, E., Prior M, Cini, E. Conway, L. Eadie, P. and Bretherton, L. (2010). Predicting language outcomes at 4 years of age: findings from early language in Victoria study. *Pediatrics*, 126, 1530-8
- Rescorla, L. (1989). The Language Development Survey: A screening tool for delayed language in toddlers. *Journal of Speech and Hearing Disorders*, 54, 587-599.
- Rice, M. and Bode, J., (1993). GAPS in the verb lexicons of children with specific language impairment. *First Language*, 13, 113-131.
- Rice, M., Noll, K.R. & Grimm, H. (1997). An extended optional infinitive stage in german speaking children with specific language impairment. *Language Acquisition*, 6(4) 255-295.
- Richards, B. J. and Malvern, D. D., (1998). *A New Research Tool: Mathematical Modelling in the Measurement of Vocabulary Diversity*. Final Report to the Economic and Social Research Council, Swindon, UK.
- Roberts, J. and Labov, W. (1995). Learning to talk Philadelphian: Acquisition of Short a by Preschool Children. *Language Variation and Change*, 7, 101-112.
- Rodgers, J.L., Cleveland, H.H. van den Oord, E. and Rowe, D.C. (2000). Resolving the debate over birth order, family size and intelligence. *American Psychologist*, 55 (6) 599-612.
- Romaine, S., (1978). Postvocalic /r/ in Scottish English: sound change in progress? In P. Trudgill, (Ed.) *Sociolinguistic Patterns in British English*. (pp. 144-56). London: Edward Arnold.
- Roseberry-McKibbin, C. (2008). *Multicultural students with special language needs: practical strategies for assessment and intervention*. Oceanside, CA: Academic Communication Associates.
- Rothweiler, M., Chilla, S. & Babur, E. (2010). Specific language impairment in Turkish: evidence from case morphology in Turkish German successive bilinguals. *Clinical Linguistics & Phonetics*, 24(7) 540-55.
- Royal College of Speech and Language Therapists (RCSLT), (1998). *Clinical Guidelines by Consensus*. London: Royal College of Speech and Language Therapists.
- Royal College of Speech and Language Therapists (RCSLT). (2005). *Royal College of Speech & Language Therapists: Clinical guidelines*. Oxon: Speechmark Publishing Ltd.

Appendices

- Rubin , A. (2010). *Statistics for Evidence Based Practice and Evaluation* 2nd edition. Belmont CA: Brookes/Cole
- Scott, C. M., and Stokes, S. (1995). Measures of syntax in school-age children and adolescents. *Language, Speech, and Hearing Services in Schools*, 26, 301–319.
- Scott, C. M., and Windsor, J. (2000). General language performance measures in spoken and written narrative and expository discourse of school-age children with language learning disabilities. *Journal of Speech, Language, and Hearing Research*, 43, 324–339.
- Shapiro, L.R., and Hudson, J.A. (1991). Tell me a make-believe story: Coherence and cohesion in young children’s picture-elicited narratives. *Developmental Psychology*, 27, 960–974.
- Shin, S. J. (2005). *Developing in Two Languages: Korean Children in America*. Clevedon: Multilingual Matters.
- Sices, L., Feudtner, C, McLaughlin, J., Drotar, D. and Williams, M. (2004). How do primary care physicians manage children with possible developmental delays? A national survey with an experimental design. *Pediatrics*, 113 (2), 274-82.
- Siren, U. (1995). Minority language transmission in early childhood. *International Journal of Early Years Education*, 3, 75–85.
- Skinner B.F. (1957) *Verbal Behavior*. Acton, MA: Copley Publishing Group.
- Skuse, D.H. (1993). Extreme deprivation in early childhood. In D. Bishop and K. Mogford (Eds.). *Language Development in Exceptional Circumstances*. (pp.29-46) Hillsdale NJ: Lawrence Erlbaum Associates.
- Sorace, A. and Serratrice, L. (2009). Internal and external interfaces in bilingual language development: Beyond structural overlap. *International Journal of Bilingualism*, 13, 195-210.
- Stanton-Chapman, T.L. Chapman, D.A. Bainbridge, N.L. and Scott, K.G. (2002). Identification of early risk factors for language impairment. *Research in Developmental Disabilities*, 23, 390-405.
- StatSoft, Inc. (2012). *Electronic Statistics Textbook*. Tulsa, OK: StatSoft. WEB: Retrieved May 22 2013 from <http://www.statsoft.com/textbook/>.
- Stenson, N. (1993). English influence on Irish: The last 100 years. *Journal of Celtic Linguistics*, 2, 107–129.
- Stevens, G. and Ishisawa, H. (2007). Variation among Siblings in the Use of a Non-English Language. *Journal of Family Issues*, 28(8): 1008-1025.

Appendices

Stiles, J., Bates, E., Thal, D., Trauner, D., and Reilly, J. (1998). Linguistic, cognitive and affective development in children with pre- and perinatal focal brain injury: A ten-year overview from the San Diego Longitudinal Project. In C. Rovee-Collier, L. Lipsit, and H. Hayne (Eds.), *Advances in Infancy Research* (pp. 131-163). Norwood, NJ: Ablex.

Stockman, I. J. (1996). The promises and pitfalls of language sample analysis as an assessment tool for linguistic minority children. *Language, Speech, and Hearing Services in the Schools*, 27, 355-366.

Stow, C. and Dodd, B. (2003). Providing an equitable service to bilingual children in the UK: a review. *International Journal of Language and Communication Disorders*, 38 (4) 351-377.

Szagon, G., Steinbrink, C., Franik, M. and Stumper, B. (2006). Development of vocabulary and grammar in young German-speaking children assessed with a German language development inventory. *First Language*, 26(3), 259-280.

Census of Population: Ireland. (1901) London: Registrar General/HMSO.

The Central Statistics Office, (1985) Census 1981, Volume 6: Irish Language. Dublin: Stationery Office.

The Central Statistics Office, (2012). *Census 2011 Profile 9 what we know – Education Skills and the Irish Language*. Dublin: Stationery Office.

The Gaeltacht Areas Orders 1956 si 245 (Ire). Dublin: Stationery Office.

The Gaeltacht Areas Orders 1967 si 200 (Ire). Dublin: Stationery Office.

The Gaeltacht Areas Orders 1974 si 192 (Ire). Dublin: Stationery Office.

The Gaeltacht Areas Orders 1982 si 350 (Ire). Dublin: Stationery Office.

Thomas, E. M. and Gathercole, V.C.M., (2007). Children's productive command of grammatical gender and mutation in Welsh: An alternative to rule-based learning. *First Language*, 27, 251-278.

Thomason, S. G. (2001). *Language Contact: an introduction*. Edinburgh: Edinburgh University Press.

Thordardottir, E. T. (2005). Early Lexical and Syntactic Development in Quebec French and English: implications for cross-linguistic and bilingual assessment. *International Journal of Language & Communication Disorders*, 40 (3), 243-278.

Thordardottir, E. & Brandeker, M. (2013). The effect of bilingual exposure versus language impairment on nonword repetition and sentence imitation scores. *Journal of Communication Disorders*, 46 (1), 1-16.

Appendices

- Thordardottir, E. and Weismer, S. (1996). Language assessment via parent report: Development of a screening instrument for Icelandic children. *First Language*, 16, 265-285.
- Thordardottir, E., Weismer, E. S. and Smith, M.E. (1997). Vocabulary learning in monolingual and bilingual clinical intervention. *Child Language Teaching and Therapy*, 13 (3), 215-227.
- Tomasello, M. (2003). *Constructing a Language: a Usage-Based Theory of Language Acquisition*. Harvard University Press.
- Tomblin, J. B. (1990). The effect of birth order on the occurrence of developmental language impairment. *The British Journal of Disorders of Communication*, 25 (1), 77-8.
- Unsworth, S., Argyri, F., Cornips, L., Hulk, A., Sorace, A., and Tsimpli, I. (2011). On the role of age of onset and input in early child bilingualism in Greek and Dutch. In Mihaela Pirvulescu et al. (Eds.). *Selected Proceedings of the 4th Conference on Generative Approaches to Language Acquisition North America (GALANA 2010)*, (pp. 249-265). Somerville, MA: Cascadilla Proceedings Project.
- Urdu, T.C. (2005). *Statistics in Plain English*. 2nd edition, United States: Lawrence Erlbaum Associates Inc.
- VanPatten, B. (1984). Morphemes and Processing Strategies. In F. Eckman, L. Bell, and D. Nelson (Eds.) *Universals of Second Language Acquisition* (pp. 88-98). Cambridge, MA: Newbury House.
- VanPatten, B. (1985). Communicative Value and Information Processing in Second Language Acquisition. In P. Larson, E. Judd, and D. Messerschmitt (Eds.) *On TESOL '84*. (pp. 89-99) Washington, D.C.: TESOL.
- VanPatten, B. (1996). *Input Processing and Grammar Instruction in Second Language Acquisition: Theory and Research*. Greenwood Publishing Group
- Valde's, G., and Figueroa, R. A. (1994). *Bilingualism and testing: A special case of bias*. Norwood, NJ: Ablex.
- Vernon-Feagans, L., Garrett-Peters, P. Willoughby, M. Mills-Koonce, R. & The Family Life Project Key Investigators, (2012). Chaos, poverty and parenting: predictors of early language development. *Early Childhood Research Quarterly*. 27(3), 339-351.
- Vihman, M.M. Lum, J. Thierry, G. Nakai, S. and Keren-Portnoy, T. (2006), Cross-linguistic experiments in infant word form recognition. In P. McCardle and E. Hoff, (Ed.) *Childhood bilingualism: Research on infancy through school age*. (pp.30-44). Multilingual Matters Ltd.
- Volterra, V. & Taeschner, T. (1978). The acquisition and development of language by bilingual children. *Journal of Child Language*, 5, 311-326.

Appendices

Wagner, C.R., Nettelbladt, U., Sahlén, B. and Nilhom, C. (2000). Conversation versus narration in pre-school children with language impairment. *International Journal of Language and Communication Disorders*, 35 (1), 83-93.

Wechsler, D. (2002a). *The Wechsler Primary and Preschool Scale of Intelligence - Third Edition UK (WPPSI-III^{UK})*. San Antonio, TX: The Psychological Corporation.

Wechsler, D. (2002b). *WPPSI-III^{UK}, Administration and Scoring Manual*. San Antonio, TX: The Psychological Corporation.

Wechsler, D. (2002c). *WPPSI-III, technical and interpretive manual*. San Antonio, TX: The Psychological Corporation.

Westerveld, M.F. and Moran, C.A. (2011). Expository language skills of young school age children. *Language, Speech and Hearing Services in Schools*, 42, 182-93.

Westerveld, M. F., Gillon, G. T. and Miller, J.F. (2004). Spoken language samples of New Zealand children in conversation and narration. *Advances in Speech-Language Pathology*, 6 (4), 195-208.

Wiig, E. H., Secord, W. A., & Semel, E. (2004). *Clinical evaluation of language fundamentals—Preschool, second edition (CELF Preschool-2)*. Toronto, Canada: The Psychological Corporation/A Harcourt Assessment Company.

Williams, J., Greene, S., McNally, S., Murray, A. and Quail, A. (2010). *Growing up in Ireland: The infants and their families. Report 1*. Department of Children and Youth Affairs. Dublin: Government Publications Available at: www.growingup.ie/fileadmin/user_upload/Conference_2010/Growing_Up_in_Ireland_-_The_Infants_and_their_Families.pdf

Wilson, J. and Henry, A. (1998). Parameter setting in a socially realistic linguistics. *Language in Society*, 27, 1-21.

Wolfram, W. (2004). Language Death and Dying. In J.K.Chambers, P. Trudgill and N. Schilling-Estes (Eds.). *The Handbook of Language Variation and Change*. (pp.764-87) MA: Blackwell.

Yip, V. and Matthews, S. (2007). *The Bilingual Child: Early Development and Language Contact*. Cambridge: Cambridge University Press.

Zambrana, I.M., Ystrom, E., Pons, F., (2012). Impact of gender, maternal education, and birth order on the development of language comprehension: a longitudinal study from 18 to 36 months of age. *Journal of Developmental & Behavioral Pediatrics*, 33 (2),146-55.

Appendices

Appendix 1: Information sheets and consent and expression of interest forms in Irish and English.



Bileog Eolais do Thuismitheoirí/Chaomhnóirí

An dtabharfaidh tú cead do do pháiste páirt a ghlacadh i scéalaíocht agus spraoi i rith am naíonra / scoile nó sa mbaile ar mhaithe le páistí eile a bhfuil fadhbanna teanga acu?



Cén fáth?

Is í aidhm an staidéir seo cur leis an tuiscint ar ghnáthfhorbairt teanga i bpáistí Gaeltachta a chabhróidh le Teiripeoirí Urlabhra agus Teanga seirbhís níos fearr a chur ar fáil do ghasúir atá á dtógáil le Gaeilge má cheaptar go bhfuil fadhb chainte acu.

Ciallóidh an tuiscint nua seo go mbeidh muid in ann uirlis mheasúnaithe a fhorbairt go speisialta le haghaidh páistí Gaeltachta, rud nach bhfuil ar fáil faoi láthair.

Cé?

Tá cúnamh ag teastáil uainn ó pháistí atá idir 3 agus 6 bliana d'aois a bhfuil Gaeilge acu sa mbaile agus nach bhfuil ag fáil teiripe urlabhra agus teanga. Tá cúnamh ag teastáil uainn óna gcuid tuismitheoirí freisin.

Mise: Is Teiripeoir Urlabhra agus Teanga mé atá ag déanamh taighde le tacaíocht ó *Ollscoil na hÉireann, Gaillimh* agus ón *gComhairle um Oideachas Gaeltachta agus Gaelscolaíochta (COGG)*.

Céard?

Ba mhaith liom teacht chuig scoil, naíonra nó teach do pháiste agus roinnt ama a chaitheamh leis/léi ag scéalaíocht is ag spraoi (níos mó sonraí istigh) agus é/í a thaifead ag caint. Tá súil agam go mbainfidh do pháiste an-taitneamh as an am seo. Gheobhaidh do pháiste bronntanais bheaga agus í ag glacadh páirt sa tionscnamh seo. Beidh ceistneoir le líonadh ag na tuismitheoirí, chomh maith (níos mó sonraí istigh).

Teideal an Staidéir:

Measúnú teanga do chainteoirí dúchais Gaeilge: forbairt uirlis mheasúnaithe maidir le cleachtais teiripe urlabhra agus teanga.

Ainm an taighdeora: Sarah-Ann Muckley Uí Chomhraí

Le maoiniú ó:

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta (COGG).

A tuismitheoir/chaomhnóir, a chara,

Tá cuireadh agat féin agus ag do ghasúr páirt a ghlacadh sa staidéar seo ar ghnáthfhorbairt teanga i gcainteoirí dúchais Gaeilge óga. Tabharfaidh an bhileog eolais seo eolas ar aidhmeanna an staidéir agus an méid a iarrfar ort féin agus ar do ghasúr a dhéanamh.

Nuair atá an bhileog eolais seo léite agat, má tá suim agat páirt a ghlacadh sa staidéar seo, le do thoil, líon **An Fhoirm Cheada** a tháinig leis an mbileog eolais seo agus cuir ar ais chuig an duine a thug duit í (nó cuir ar ais chugam féin í).

Muna bhfuil tú cinnte go fóill agus **má tá tuilleadh eolais uait, le do thoil, líon agus cuir ar ais An Fhoirm Léirithe Suime** nó déan teagmháil liom go díreach ag 087 610 6111 nó s.muckley1@nuigalway.ie. Tar éis labhairt liom, má tá tú sásta páirt a ghlacadh sa tionscnamh, iarrfaidh mé ort an Fhoirm Cheada a shíniú agus ansin féadfaimid tosnú.

Le do thoil coinnigh an bhileog eolais seo mar eolas duit féin. Ag an bpointe seo, ba mhaith liom **buíochas ó chroí** a ghabháil leat as an mbileog eolais seo a léamh agus as smaoineamh ar pháirt a ghlacadh sa tionscnamh tábhachtach seo. Tá freagraí thíos ar cheisteanna a chuirtear go minic maidir leis an tionscnamh seo.

Ceard í aidhm an staidéir?

‘Sí aidhm an staidéir ná acmhainn fheiliúnach a chur ar fáil do theiripeoirí urlabhra agus teanga a bhíonn ag obair le páistí óga sa nGaeltacht. Is mar gheall ar an easpa eolais ar fhorbairt nádúrtha teanga i ngasúir atá á dtógáil le Gaeilge atá an taighde seo á dhéanamh. Braitheann an teiripeoir urlabhra agus teanga ar eolas faoi ghnáthfhorbairt teanga le cabhrú le gasúir má cheaptar go bhfuil fadhb chainte acu. Tá an t-eolas seo ar fáil go forleathan do ghasúir atá á dtógáil le Béarla. Níl eolas ar ghnáthfhorbairt teanga ar fáil do ghasúir atá á dtógáil le Gaeilge áfach. ‘Sí aidhm an staidéir seo cur leis an tuiscint ar fhorbairt teanga i bpáistí Gaeltachta a chabhróidh le teiripeoirí urlabhra agus teanga seirbhís níos fearr a chur ar fáil do ghasúir atá á dtógáil le Gaeilge má cheaptar go bhfuil fadhb chainte aige/ aici.

Cén fáth gur roghnaíodh mo ghasúr?

Roghnaíodh do ghasúr de bharr go bhfuil sé nó sí 3, 4, 5 nó 6 bliana d'aois, go bhfuil an Ghaeilge ina teanga bhaile aige/aici agus go bhfuil cónaí air/uirthi i nGaeltacht Chonamara.

Céard a bheas i gceist?

Tabharfaidh mé trí chuairt ar scoil/naíonra do pháiste. Muna bhfuil do pháiste ag dul chuig naíonra/scoil go fóill is féidir gach rud a dhéanamh i do theach féin nó san *Ionad Tacaíochta Teaghlaigh* in Indreabhán. Beidh scéalaíocht agus spraoi i gceist agus déanfaidh mé taifead ar do pháiste agus é/í ag caint. Iarrfaidh mé ort dhá cheistneoir a líonadh amach sa mbaile. Bainfidh na ceisteanna seo le forbairt ghinearálta do pháiste agus na teangacha a chloiseann sí/sé go laethúil.

****Má tá tú sásta níos mó tacaíochta a thabhairt don tionscnaimh casfaidh mé leat le do pháiste/pháistí ag an scoil/ naíonra nó ag an *Ionad Tacaíochta Teaghlaigh* in Indreabhán nó ag do theach féin, cibé áit is mó a fheileann duit. Tógfaidh sé seo thart ar 30 nóiméad (tuilleadh sonraí thíos).**

Seisiún Grúpa amháin agus dhá sheisiún aonair le gach páiste

(mairfidh gach cuairt thart ar 40 nóiméad an pháiste):

Tabharfaidh mé cuairt ar an seomra ranga roimh chasadh leis na páistí ina n-aonair. Glacfaidh mé páirt i roinnt gnáthghníomhaíochtaí ranga ionas go gcuirfidh mé féin agus na gasúir aithne ar a chéile agus go mothóidh siad compordach timpeall orm.

Seisiún a 1: Athinseacht scéil ó leabhar pictiúirí agus taifead fuaime. Rachaidh mé féin agus do pháiste isteach i seomra eile ina bhfuil bord le agus gléas taifeada fuaime (ceann beag a bhreathnaíonn cosúil le fón póca). (Cloífidh mé le rialacha na scoile/ an naíonra maidir le bheith ag obair go haonaránach le páistí.) Tabharfaidh mé criáin do do ghasúr ionas go mbeidh sí/sé in ann pictiúirí a tharraingt liom ar feadh tamaill. Nuair a mhothaím go bhfuil do pháiste sona agus compordach liom, tógfaidh mé amach leabhar pictiúirí. Tabharfaidh mé míniú mar seo do do ghasúr: *"Seo leabhar lán le pictiúirí. Insíonn sé scéal deas faoi bhuachaill agus a mhadra agus a fhrog. Ar dtús ba mhaith liom go n-éistfidh tú leis an scéal agus muid ag breathnú ar na pictiúirí. Ansin imeoidh ar ais go tús an leabhair agus beidh seans agat féin an scéal a inseacht domsa."* Déanfar taifead fuaime ar chaint do ghasúr. Coinneofar an taifead seo faoi ghlas.

Seisiún a 2: Measúnú éisteachta agus measúnú síceolaíochta gairid. Beidh an dá cheann seo bunaithe ar spraoi le blocanna agus pictiúirí agus ní imeoidh siad thar 15 nóiméad an ceann.

Ar deireadh, iarrfaidh mé ort dhá cheistneoir a líonadh ar fhorbairt ghinearálta do ghasúr agus ar na teangacha a chloiseann do ghasúr. Tá sé tábhachtach go bhfuil eolas ag Teiripeoirí Urlabhra agus Teanga ar na teangacha difriúla a chloiseann gasúr agus a c(h)umas teanga á thomhais acu.

****Má tá tú sásta níos mó tacaíochta a thabhairt don tionscnamh agus páirt a ghlacadh sa scéalaíocht tú féin bheadh sé sin iontach. Seo a leanas a bheas i gceist:**

Tógfaidh sé seo thart ar 30 nóiméad:

Ba mhaith liom taifead fuaime a dhéanamh ort is tú ag inseacht scéil as leabhar pictiúirí do do pháiste/pháistí. 'Sí do chanúint an sampla agus an sprioc atá ag do pháiste agus í ag foghlaim de réir a chéile

le labhairt ar nós duine fásta. Trí thaifead fuaime a dhéanamh ar thuismitheoirí chomh maith le páistí beidh muid in ann a thomhais cé chomh gar don chaoi a labhraíonn daoine fásta sa phobal is atá páistí ag aoiseanna difriúla. Tabharfaidh an t-eolas seo an-chúnamh do theiripeoirí urlabhra agus teanga agus iad ag cabhrú le páistí le deacrachtaí teanga sa nGaeltacht.

An gá do mo pháiste páirt a ghlacadh sa tionscnamh seo?

Tá sé mar aidhm ag an tionscnamh seo staidéar a dhéanamh ar ghnáthfhorbairt teanga i ngnáthpháistí Gaeltachta. Is fútsa atá sé cinneadh a dhéanamh an ceart duit féin agus do do ghasúr páirt a ghlacadh. Má shocraíonn tú nach bhfuil tú sásta páirt a ghlacadh glacfar leis seo gan argóint. Má thugann tú cead agus má athraíonn tú d'intinn is féidir leat do ghasúr a tharraingt as an taighde ag am ar bith gan cúis a thabhairt agus gan argóint. Mar an gcéanna, má tharlaíonn sé ag pointe ar bith nach bhfuil fonn ar do ghasúr páirt a ghlacadh sa staidéar a thuilleadh, is féidir leis/léi tarraingt amach as gan aon fhadhb.

Cén leas a d'fhéadfadh sé a dhéanamh páirt a ghlacadh?

Níl leas díreach ar bith do do ghasúr nó duit féin trí pháirt a ghlacadh sa staidéar. É sin ráite, tá súil agam go mbainfidh do ghasúr taitneamh as an scéalaíocht agus spraoi agus cuirfidh an staidéar seo leis an tuiscint atá againn ar ghnáthfhorbairt sa nGaeilge agus cabhróidh sé seo le Teiripeoirí Urlabhra agus Teanga atá ag obair le gasúir atá á dtógáil le Gaeilge.

An bhfuil aon mhíbhuntáiste trí pháirt a ghlacadh?

Ar ndóigh, níl baol sláinte dá laghad sa staidéar seo do do ghasúr nó duit féin. D'fhéadfadh sé tarlú go mb'fhéidir go mbeadh do ghasúr cineál cúthail ós comhair strainséara. Ionas go bhfaighfidh na gasúir

taithí orm tabharfaidh mé cuairt ar an seomra ranga roimh chasadh leo go haonarach. Nuair a chasaim le do ghasúr go haonarach molfaidh mé dó/di roinnt pictiúirí a tharraingt liom agus beagán cainte a dhéanamh liom faoi na pictiúirí len iad a chur ar a gcompord.

An mbeidh ár dtorthaí faoi rún?

Coinneofar an t-eolas ar fad a bhaileofar go hiomlán faoi rún. Ní úsáidfear bhur n-ainmneacha in aon tuairisc (foilsithe nó neamh-foilsithe). Tabharfar uimhir do chuile ghasúr agus is agam féin amháin a bheidh a fhios cén uimhir a bhaineann le cén gasúr, cén teaghlach agus cén scoil/naíonra. Má tá fonn ort fáil amach faoi thorthaí do ghasúr féin nó má tá fonn ort taifead do pháiste a chloisteáil tá míle fáilte romhat dul i dteagmháil liom. Tá mo shonraí teangmhála thíos.

Céard a tharlóidh do thorthaí an staidéir?

Cabhróidh torthaí an staidéar seo linn measúnú teanga a fhorbairt. Beidh torthaí an staidéir agus an measúnú seo curtha ar fáil do theiripeoirí urlabhra agus teanga atá agus a bheas ag obair le cainteoirí dúchais Gaeilge óga i nGaeltacht Chonamara agus sna Gaeltachtaí eile timpeall na tíre. Táthar ag súil go bhfoilseofar torthaí an staidéir in iris a thabharfaidh an deis do theiripeoirí urlabhra agus teanga i bpobail mionteangacha eile leas a bhaint as an taighde. Ní úsáidfear ainm do ghasúr nó aon duine i do chlann in aon tuairisc (foilsithe nó neamh-foilsithe). Má theastaíonn uait achoimre de na torthaí a fháil ag deireadh an staidéir, le do thoil, déan teagmháil liom. Tá mo shonraí teagmhála thíos.

Cé a rinne léirmheas ar an staidéar?

Rinne Coiste Eiticí-Taighde Ollscoil na hÉireann, Gaillimh (NUIGREC) léirmheas ar an bplean agus tá cead eiticíúil tugtha acu.

Cé leis a dhéanfaidh mé teangmháil le níos mó sonraí a fháil?

Má tá aon cheist eile agat déan teangmháil, le do thoil, liom féin nó le duine de m'fheitheoirí. Tá na sonraí teangmhála uilig thíos.

Is iad seo a leanas mo shonraí teangmhála:

Sarah-Ann Muckley Uí Chomhraí

Seoladh: Roinn na Teiripe Urlabhra agus Teanga, Áras Moyola, OÉ Gaillimh, Bóthar an Chaisleáin Nua, Gaillimh.

Seoladh r.phost: s.muckley1@nuigalway.ie

Uimhir fóin: 091 494181 / 0876106111

Is iad seo a leanas sonraí teangmhála m'fheitheoirí:

An Dr. Stanislava Antonijević

Seoladh r.phost: stanislava.antonijevic@nuigalway.ie

Uimhir fóin: 091 495623

An Dr. Conchúr Ó Giollagáin

Seoladh r.phost: conchur.ogiollagain@nuigalway.ie

Uimhir fóin: 091 595101

Má tá aon inní ort faoin staidéar seo agus má theastaíonn uait dul i dteangmháil le duine neamhspleách, is féidir dul i dteangmháil le Cathaoirleach Coiste Eiticí-Taighde Ollscoil na hÉireann Gaillimh, c/o Oifig an Leas Uachtarán Taighde, OÉGaillimh, ethics@nuigalway.ie

Arís **go raibh míle maith agaibh** as an mbileog eolais seo a léamh agus as smaoineamh ar pháirt a ghlacadh sa tionscnamh tábhachtach seo. Má tá tú sásta páirt a ghlacadh sa tionscnamh seo líon **An Fhoirm Cheada** a tháinig leis an mbileog seo agus tabhair ar ais chuig an duine a thug duit í nó cuir sa bpost chugam féin í.

Appendices

Muna bhfuil tú cinnte go fóill agus má tá suim agat **níos mó eolais a fháil, le do thoil, líon An Fhoirm Léirithe Suime** a tháinig leis an mbileog seo nó déan teagmháil liom go díreach.

Le beannacht,

Sarah-Ann Muckley Uí Chomhraí

Taighdeoir agus Teiripeoir Urlabhra agus Teanga.

Seoladh: Roinn na Teiripe Urlabhra agus Teanga, Áras Moyola,
OÉ Gaillimh, Bóthar an Chaisleáin Nua, Gaillimh.

R.phost: s.muckley1@nuigalway.ie

Uimhir fóin: 0876106111



Information Leaflet for Parents / Guardians

Will you allow your child to participate in storytelling and play during preschool / school time or at home for the benefit of other children who have language difficulties?



Why?

The aim of this study is to add to understanding of typical Irish language development in children in the Gaeltacht in order to help speech and language therapists to provide a better service to children being raised through Irish if a language difficulty is suspected. This new understanding will mean that, for the first time ever, we will be able to develop an assessment tool specially designed for the Irish speaking children of Connemara.

Who?

We need help from children **between 3 and 6 years of age** who hear **Irish at home** and who are **not** receiving speech and language therapy. We also need help from their parents.

Me: I am a speech and language therapist who is undertaking research with support from the *National University of Ireland, Galway* and from *An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta (COGG)*.

What?

I would like to visit your child's school, preschool or home and spend some time with him / her storytelling and playing (more details inside) and to record him / her talking. I hope that your child really enjoys this time. Your child will receive little presents during her / his participation in the study. There will also be a questionnaire for you, the parent, to fill out (more details inside).

Title of the study: Language assessment for native Irish speakers: development of assessment tools for speech and language therapy practice.

Name of researcher: Sarah-Ann Muckley Uí Chomhraí.

Funding Source:

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta (COGG).

Dear Parent / Guardian,

You and your child are invited to participate in this study of typical language development in young native Irish speaking children. This information leaflet will provide information on the aims of the study and what will be asked of you and your child if you decide to take part.

After you have read this information leaflet, if you are interested in taking part in this study, please, fill out the **Consent Form** that came with this information leaflet and return it to your child's teacher or directly to me.

If you have not yet decided and would like more information, please, fill out and return the **Expression of Interest Form** or contact me directly at 087 610 6111 or s.muckley1@nuigalway.ie. After speaking with me if you are happy to participate in the study, I will ask you to fill out the Consent Form and then we can begin.

Please keep this information leaflet as a record for yourself. At this point I would like to sincerely thank you for taking the time to read this information leaflet and for considering taking part in this important study. Answers to frequently asked questions with regard to this study are provided below.

What is the aim of this study?

The aim of this study is to make an appropriate assessment resource available to speech and language therapists who work with young Irish speaking children in the Gaeltacht. The research is being undertaken because of the lack of information on natural language development in children who are being raised with Irish in the Gaeltacht. The speech and language therapist depends on information on typical language development to help children who have language difficulties. This information is widely available for children who are being raised through English. However information on typical language is not available for children who are being raised through Irish. The aim of this study is to add to understanding of typical Irish language development in children in the Gaeltacht in order to help speech and language therapists to provide a better service to children being raised through Irish if a language difficulty is suspected.

Why was my child chosen?

Your child was chosen because she / he is 3, 4, 5 or 6 years of age, has Irish as a home language and lives in the Connemara Gaeltacht.

What will be involved?

I will visit your child at his /her school or preschool three times. If your child is not yet attending school or preschool, all visits can happen at your own home or in the Family Support Centre (*an t-Ionad Tacaíochta Teaghlaigh*) in Indreabhán. The visits will be based on storytelling and play and I will audio record your child speaking. You will also be asked to fill out two questionnaires at home. The questions will be about your child's general development and the language(s) he / she hears on a daily basis.

****If you are willing to participate further in the study I will meet you and your child(ren) at the school, preschool, the Family Support Centre (*an t-Ionad Tacaíochta Teaghlaigh*) in Indreabhán or at your own home, wherever would suit you best. This will take about 30 minutes (more details below).**

One group session and two individual sessions with each child (each visit will last about 40 minutes):

I will visit the classroom /preschool before working with the children individually. I'll take part in some typical classroom/ preschool activities to allow the children and myself can get to know each other and so that they will feel comfortable around me.

Session 1: Retelling stories from picture books and audio recording. Myself and your child will go into another room. An audio recording device which looks a bit like a mobile phone will be sitting on the table. (I'll follow the schools' / preschools' guidelines for working with children individually.) I'll give your child crayons so that he / she will be able to draw pictures with me for a while. When I feel that your child is happy and comfortable with me I'll take out a picture book. I'll give an explanation such as the following to your child: "*Seo leabhar lán le pictiúirí. Insíonn sé scéal deas faoi bhuachaill agus a mhadra*

Appendices

agus a fhrog. Ar dtús ba mhaith liom go n-éistfidh tú leis an scéal agus muid ag breathnú ar na pictiúirí. Ansin imeoid ar ais go tús an leabhair agus beidh seans agat féin an scéal a inseacht domsa."

("This is a book full of pictures. It tells a nice story about a boy, his dog and a frog. First I'd like you to listen to the story as we're looking at the pictures. Then we'll go back to the beginning of the book and it'll be your turn to tell me the story.") Your child's speech will be audio-recorded. This audio recording will be securely kept under the protection of a password known by the researcher alone.

Session 2: A hearing screening and a short psychological (intelligence) assessment. These will be based on play with blocks and pictures and they won't last longer than 15 minutes each.

Finally, I'll ask you to fill out two questionnaires on the general development of your child and on the languages he / she hears on a daily basis. It is important that speech and language therapists have information on the influence of different languages that children hear when they are measuring their language ability.

**If you're happy to participate further in the study and take part in storytelling yourself that would be great. The following is what would be involved:

This will take about 30 minutes:

I would like to audio-record you while you are telling your child(ren) a story from a picture book. Your dialect is your child's model and goal as he / she is gradually learning how to speak like an adult. By studying parent as well as child language we will be able to measure how close to the adult language in the community the language of children is at different ages. This understanding will be of great help to speech and language therapists in their support of Irish speaking children with language difficulties.

Does my child have to take part in this study?

The aim of this project is to study typical language development in typical Irish Gaeltacht children. It is up to you whether you and your child should take part. If you decide that you are not happy to take part, this will be accepted without argument. If you give permission for your child to take part and if you later change your mind you can withdraw permission at any time without giving a reason and without discussion. Similarly, if your child decides at any point that he /she does not wish to continue with the study anymore this decision will also be respected.

What benefits are associated with participating in this study?

Participating in this study will probably not be of direct benefit to you or your child. That said, I expect that your child will enjoy the storytelling and play involved in the study. Also, the results of this study will add to our understanding of typical Irish language development and this will support speech and language therapists who are working with children who are being raised with Irish as a home language.

Is there any disadvantage associated with taking part?

There is, of course, no health risk to you or your child in taking part in this study. It is possible that your child may feel shy with me because I am a stranger to them. I will visit the classroom / preschool and engage in group activities before working with your child individually so that the children will have a chance to get to know me. When I meet your child individually I'll encourage them to draw some pictures and to chat about the pictures in order to put them at their ease.

Will my child's results be confidential?

Each child's information will be kept completely confidential. Your names will not be used in any report (published or unpublished). Each child will be given a number and only I will know which number corresponds to which child, which family and which school/preschool. If you would like to find out about your own child's results or if you would like to hear your child's audio-recording, you are very welcome to contact me. My contact details are below.

What will happen to the results of the study?

The results of this study will help us to develop a language assessment for use with Irish speaking children in the Gaeltacht. The results will be made available to speech and language therapists who are and who will be working young native Irish speakers in the Connemara Gaeltacht and in the other Gaeltachtaí around the country. We are hoping to publish the results of this study in a journal that will allow speech and language therapists in other minority language communities around the world to also benefit from this research. Neither your name nor the names of anyone in your family will be used in any report (published or unpublished). If you would like to get a summary of the results at the end of the study, please, contact me. My contact details are below.

Who reviewed this study?

The National University of Ireland, Galway's Research Ethics Committee (NUIGREC) reviewed the plan for this study and gave their ethical approval.

Who can I contact to get more details?

If you have any other questions, please contact myself or one of my supervisors. The contact details are provided below .

The following are my own contact details:

Sarah-Ann Muckley Uí Chomhraí

Address: Speech and Language Therapy Dept., Áras Moyola,
NUI, Galway, Newcastle Road, Galway.

Email: s.muckley1@nuigalway.ie

Phone: 091 494181 / 0876106111

The following are the contact details of my supervisors:

Dr. Stanislava Antonijević

Email: stanislava.antonijevic@nuigalway.ie

Phone: 091 495623

Dr. Conchúr Ó Giollagáin

Email: conchur.ogiollagain@nuigalway.ie

Phone: 091 595101

If you have any concerns about this study and would like to contact someone independent, you can contact the Chairperson of the Research Ethics Committee, National University of Ireland, Galway, c/o Office of the Vice President for Research, NUI Galway, ethics@nuigalway.ie

Again **many many thanks** for reading this information leaflet and for considering taking part in this important study. If you are happy to take part in this study please complete the Consent Form that came with this leaflet and return it to your child's teacher or send it to me directly.

Appendices

If you have not yet decided and would like more information, please, complete the **Expression of Interest Form** that came with this leaflet and return to your child's teacher or contact me directly .

Le beannacht,

Sarah-Ann Muckley Uí Chomhraí
Researcher and Speech and Language Therapist.

Address: Speech and Language Therapy Dept., Áras Moyola,
National University of Ireland, Galway, Newcastle Road, Galway.
Email: s.muckley1@nuigalway.ie
Phone: 0876106111



Teideal an Staidéir: Measúnú teanga do chainteoirí dúchais Gaeilge: forbairt uirlis mheasúnaithe maidir le cleachtais teiripe urlabhra agus teanga.

Ainm an taighdeora: Sarah-Ann Muckley Uí Chomhraí.

AN FHOIRM CHEADA :

Tugaim,

(ainm iomlán an tuismitheora/chaomhnóra) cead do mo pháiste:

(ainm iomlán an pháiste) páirt a ghlacadh sa tionscnamh seo.

Le do thoil, cuir tic sa mbosca trasna ó ghach ráiteas

Tá mé sásta go dtuigim an t-eolas sa mbileog eolais, go raibh deis agam ceistanna a chur agus go raibh dóthain ama agam le smaoineamh faoin eolas sin.	
Go bhfios dom ní ghoillfidh na tascanna a bheas i gceist sa staidéar seo ar an bpáiste thuasluaite.	

Tuigim go nglacann an pháiste páirt sa tionscnamh seo go deonach agus gur féidir liom mo chead a tharraingt siar gan argóint.	
-------------------------------------------------------------------------------------------------------------------------------	--

Aois agus Dáta Breithe an pháiste:

Scoil / Naíonra (má tá ceann i gceist):

1. An labhraíonn tú Gaeilge an chuid is mó den am le do pháiste?

Labhraíonn / Ní labhraíonn

2. An bhfuil tú imníoch faoi fhorbairt éisteachta, chainte, theanga nó ghinearálta do pháiste?

Tá / Níl

Má tá, le do thoil, tabhair sonraí:

3. An bhfuair do pháiste teiripe urlabhra agus teanga riamh?

Fuair / Ní bhfuair

Má fuair, le do thoil, tabhair sonraí maidir le cén uair agus cén fáth.

Appendices

Fón póca: _____

Fón baile: _____

An t-am is feiliúnaí le teagmháil a dhéanamh leat:

Síniú tuismitheora / caomhnóra:



Title of the study: Language assessment for native Irish speakers: development of assessment tools for speech and language therapy practice.

Name of researcher: Sarah-Ann Muckley Uí Chomhraí.

CONSENT FORM:

I,

(full name of parent / guardian) give permission to my child:

(full name of child) to participate in this study.

Please, put a tick in the box beside each statement below:

I am happy that I understand the information in the information leaflet, that I had the opportunity to ask questions and that I had enough time to think about that information.	
To the best of my knowledge the tasks involved in this study will not upset the abovementioned child.	
I understand that my child participation in this study is voluntary and that I can withdraw my permission without discussion at any time.	

Age and Date of Birth of child:

School / Preschool (if relevant):

1. Do you speak Irish the majority of the time with your child?

Yes / No

2. Are you concerned about the hearing, speech, language or general development of your child?

Yes / No

If so, please give details:

3. Did you child ever receive speech and language therapy?

Yes /No

If so, please, give details with regard to when and why.

Mobile: _____

Home phone: _____

Appendices

**The time which is most convenient for you to receive a
phonecall:**

Signature of parent / guardian:



Teideal an Staidéir: Measúnú teanga do chainteoirí dúchais Gaeilge: forbairt uirlis mheasúnaithe maidir le cleachtais teiripe urlabhra agus teanga.

Ainm an taighdeora: Sarah-Ann Muckley Uí Chomhraí.

AN FHOIRM CHEADA /TOILITHE:

Táim,

(ainm iomlán an tuismitheora/chaomhnóra) sásta go ndéanfar taifead fuaimne orm féin is ar mo pháiste is mé ag insint scéal dó/di.

Tá mé sásta go dtuigim an t-eolas sa mbileog eolais, go raibh deis agam ceistanna a chur agus go raibh dóthain ama agam le smaoineamh faoin eolas sin.

Tuigim nach n-úsáidfear m'ainm nó ainm aon duine i mo chlann in aon tuairisc (foilsithe nó neamh-foilsithe).

Tuigim go nglacaim páirt sa tionscnamh seo go deonach agus gur féidir liom mo chead a tharraingt siar gan argóint.

Síniú tuismitheora / caomhnóra:



Title of the study: Language assessment for native Irish speakers: development of assessment tools for speech and language therapy practice.

Name of researcher: Sarah-Ann Muckley Uí Chomhraí.

CONSENT FORM:

I,

(full name of parent / guardian) am happy to allow audio recording of myself and my child while I am telling him/her a story.

I am happy that I understand the information in the information leaflet, that I had the opportunity to ask questions and that I had enough time to think about that information.

I understand that neither my name nor the name of any member of my family will be used in any report (published or unpublished).

I understand that my participation in this study is voluntary and that I can withdraw my consent without discussion at any time.

Signature of parent / guardian:



An Fhoirm Léirithe Suime

A Thuismitheoir/ Chaomhnóir, a chara,

Go raibh míle maith agat as an eolas a tháinig leis an bhfoirm seo a léamh. Má tá suim agat tuilleadh a fháil amach faoin tionscnamh taighde seo, le do thoil, líon isteach do chuid sonraí teagmhála thíos agus tabhair an fhoirm seo ar ais do mhúinteoir do ghasúir nó cur chugam sa bpost í (tá mo sheoladh ag deireadh na bileoige eolais). Déanfaidh mé teagmháil leat ag am atá feiliúnach duit féin agus beidh mé thar a bheith sásta ceist ar bith a d'fhéadfadh a bheith agat a fhreagairt.

Ní foirm cheada í seo. Níl sa bhfoirm seo ach bealach le suim a léiriú. Má theastaíonn uait cead a thabhairt do do ghasúr anois le do thoil líon amach **an fhoirm cheada**.

Ainm iomlán do pháiste: _____

Dáta breithe do pháiste:

Scoil/Naíonra: _____

Ainm an tuismitheora / caomhnóra:

Fón póca: _____

Fón baile: _____

An t-am is feiliúnaí le teagmháil a dhéanamh leat:



The Expression of Interest Form:

Dear Parent / Guardian,

Thank you very much for reading the information which came with this form. If you are interested in finding out more about this study, please, fill in your contact details below and give this form back to your child's teacher or send it directly to me (my address is at the end of the information leaflet). I will contact you at a time that is convenient for you and I will be very happy any questions you may have.

This is not a consent form. This form is simply a way of expressing interest in the study. If you would like to give consent to your child now, please fill out the Consent Form that also came in this envelope.

Full name of your child: _____

Date of birth of your child:

School / Preschool: _____

Name of parent / guardian:

Mobile: _____

House phone: _____

The time which is most convenient for you to receive a phonecall:



Bileog Eolais do Mhúinteoirí

An dtabharfaidh tú tacaíocht do thionscnamh taighde bunaithe ar scéalaíocht agus spraoi i rith am naíonra / scoile ar mhaithe le seirbhís Theiripe Urlabhra agus Teanga níos fearr a chur ar fáil do pháistí sa nGaeltacht?



Cén fáth?

Is í aidhm an staidéir seo cuir leis an tuiscint ar ghnáthfhorbairt theanga i bpáistí Gaeltachta a chabhróidh le teiripeoirí urlabhra agus teanga seirbhís níos fearr a chur ar fáil do ghasúir atá á dtógáil le Gaeilge má cheaptar go bhfuil fadhb chainte acu. Ciallóidh an tuiscint nua seo go mbeidh muid in ann uirlis mheasúnaithe maidir le cleachtais teiripe urlabhra agus teanga a fhorbairt go speisialta le haghaidh páistí Gaeltachta, rud nach bhfuil ar fáil faoi láthair.

Cé?

Tá cúnamh ag teastáil uainn ó pháistí atá 3, 4, 5 agus 6 bliana d'aois a bhfuil Gaeilge acu sa mbaile agus nach bhfuil ag fáil teiripe urlabhra agus teanga. Tá cúnamh ag teastáil uainn óna gcuid tuismitheoirí agus múinteoirí chomh maith (níos mó sonraí istigh). **D'fhéadfadh tuismitheoir cead a thabhairt dá p(h)áiste amháin nó d'fhéadfadh sé/sí glacadh páirt é/í féin chomh maith (níos mó sonraí istigh).**

Mise: Is teiripeoir urlabhra agus teanga mé atá ag déanamh taighde le tacaíocht ó *Ollscoil na hÉireann, Gaillimh* agus ón *gComhairle um Oideachas Gaeltachta agus Gaelscolaíochta (COGG)*.

Céard?

Ba mhaith liom tíocht chuig do naíonra/scoil agus roinnt ama a chaitheamh leis na páistí ag scéalaíocht is ag spraoi (níos mó sonraí istigh) agus iad a thaifead ag caint. Tá súil agam go mbainfidh na páistí an-taitneamh as an am seo. Gheobhaidh gach páiste bronntanais bheaga agus iad ag glacadh páirt sa tionscnamh seo. Beidh ceistneoir le líonadh ag na tuismitheoirí freisin (níos mó sonraí istigh).

Teideal an Staidéir:

Measúnú teanga do chainteoirí dúchais Gaeilge: forbairt uirlis mheasúnaithe maidir le cleachtais teiripe urlabhra agus teanga.

Ainm an taighdeora: Sarah-Ann Muckley Uí Chomhraí

Le maoiniú ó:

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta (COGG).

A mhúinteoir, a chara,

Tá cuireadh agat féin agus ag cuid de na gasúir i do rang/naíonra agus a dtuismitheoirí páirt a ghlacadh sa staidéar seo ar fhorbairt teanga i gcainteoirí dúchais Gaeilge óga. Ba mhaith linn páistí a chloiseann Gaeilge don chuid is mó sa mbaile a chur san áireamh sa staidéar seo. Tabharfaidh an bhileog eolais seo eolas ar aidhmeanna an staidéir agus an méid a iarrfar ort féin, ar na gasúir agus ar a dtuismitheoirí a dhéanamh má shocraíonn sibh páirt a ghlacadh ann. Tá bileogaí

eolais do na tuismitheoirí freisin. Iarrfar ar na tuismitheoirí foirmeacha ceada a shíniú agus a thabhairt ar ais chugat féin.

Má tá suim ag tuismitheoir cead a thabhairt dá p(h)áiste páirt a ghlacadh sa staidéar seo, **iarrtar orthu an fhoirm cheada** a tháinig lena mbileog eolais a líonadh agus a chur ar ais chuig múinteoir a bpáiste nó chugam féin.

Muna bhfuil tuismitheoir cinnte go fóill agus **má tá níos mó eolais uathu, iarrtar orthu An Fhoirm Léirithe Suime** a tháinig lena b(h)ileog eolais a líonadh agus a thabhairt ar ais chuig múinteoir a p(h)áiste nó glaoch a chur ormsa. Tar éis labhairt liom, má tá siad sásta páirt a ghlacadh sa tionscnamh, iarrfaidh mé orthu an Fhoirm Cheada a shíniú agus ansin féadfaimid tosnú.

Le do thoil coinnigh an bhileog eolais seo mar eolas duit féin. Má tá ceist ar bith agat déan teangmháil liom. Beidh mé lán sásta ceist ar bith atá agat a fhreagairt. Tá na sonraí teagmhála uilig ag bun na bileoige seo.

Ag an bpointe seo, ba mhaith liom **buíochas ó chroí** a ghabháil leat as an mbileog eolais seo a léamh agus as smaoineamh ar pháirt a ghlacadh sa tionscnamh tábhachtach seo. Tá freagraí thíos ar cheisteanna a chuirtear go minic maidir leis an tionscnamh seo.

Ceard í aidhm an staidéir?

Sí aidhm an staidéir acmhainn fheiliúnach a chur ar fáil do theiripeoirí urlabhra agus teanga a bhíonn ag obair le gasúir sa nGaeltacht. Is mar gheall ar an easpa eolais ar fhorbairt nádúrtha teanga i ngasúir atá á dtógáil le Gaeilge atá an taighde seo á dhéanamh. Braitheann an teiripeoir urlabhra agus teanga ar eolas faoi ghnáthfhorbairt teanga le cabhrú le gasúir má cheaptar go bhfuil fadhb chainte acu. Tá an t-eolas seo ar fáil go forleathan do ghasúir atá á dtógáil le Béarla

amháin. Níl eolas ar ghnáthfhorbairt teanga ar fáil do ghasúir atá á dtógáil le Gaeilge áfach. 'Sí aidhm an staidéir seo cuir leis an tuiscint ar fhorbairt teanga i bpáistí le Gaeilge a chabhróidh le teiripeoirí urlabhra agus teanga seirbhís níos fearr a chur ar fáil do ghasúr atá á dtógáil le Gaeilge má cheaptar go bhfuil fadhb chainte aige/aici.

Cén gasúir a roghnófar le páirt a ghlacadh sa staidéar seo?

Tabharfar cuireadh do pháistí atá idir 3 agus 6 bliana d'aois, a chloiseann Gaeilge don chuid is mó sa mbaile agus **nach bhfuil** ag fáil teiripe urlabhra agus teanga páirt a ghlacadh sa staidéar seo.

Céard a bheas i gceist le mo pháirt mar mhúinteoir sa staidéar seo?

Iarrfar ort an méid seo a leanas a dhéanamh:

1. Clúdaigh litreacha (le bileogaí eolais agus foirmeacha curtha isteach iontu agam féin) a chur abhaile le roinnt páistí i do naíonra/ rang agus, níos déanaí, na foirmeacha sin a bhailiú nuair a thagann siad ar ais ó na tuismitheoirí.
2. Ligint don taighdeoir páirt a ghlacadh i ngnáthimeachtaí an ranga (mar shampla am sùgradh nó am scéalaíochta) ar feadh tamaill le seans a thabhairt do na páistí aithne a chur uirthi.
3. Ligint do roinnt páistí imeacht ó ghnáthimeachtaí naíonra/ ranga ar dhá ócáid le páirt a ghlacadh sa staidéar seo. Tá níos mó sonraí thíos.

Céard a bhéas i gceist do na páistí agus dá thuismitheoirí?

Feicfidh mé gach páiste dhá uair sa naíonra / scoil. Beidh scéalaíocht agus spraoi i gceist agus déanfaidh mé taifead ar an bpáiste agus é/í ag caint. Iarrfaidh mé ar an tuismitheoir ceistneoir a líonadh sa mbaile. Bainfidh na ceistanna seo le forbairt ghinearálta an pháiste agus na teangacha a chloiseann sí/sé go laethúil.

****Má tá tuismitheoir sásta níos mó tacaíochta a thabhairt don tionscnamh seo casfaidh mé leo lena bpáiste/bpáistí ag an naíonra / scoil nó ag an Ionad Tacaíochta Teaghlaigh in Indreabhán nó ag a dteach féin, cibé áit is mó a fheileann dóibh. Tógfaidh sé seo thart ar 30 nóiméad.**

Dhá sheisiún aonair le gach páiste (mairfidh gach cuairt thart ar 40 nóiméad an pháiste):

Tabharfaidh mé cuairt ar an seomra ranga roimh chasadh leis na páistí ina n-aonair. Glacfaidh mé páirt i roinnt gnáthghníomhaíochtaí ranga ionas go gcuirfidh mé féin agus na gasúir aithne ar a chéile agus go mothóidh siad compordach timpeall orm.

Seisiún a 1: Athinseacht scéil ó leabhar pictiúirí agus taifead fuaim. Rachaidh mé féin agus an páiste isteach i seomra eile ina bhfuil bord agus gléas taifeada fuaim (ceann beag a bhreathnaíonn cosúil le fón póca). (Cloífidh mé le rialacha na scoile / an naíonra maidir le bheith ag obair go haonaránach le páistí.) Tabharfaidh mé criáin don ghasúr ionas go mbeidh sí/sé in ann pictiúirí a tharraingt liom ar feadh tamaill. Nuair a mhothaím go bhfuil an páiste sona agus compordach liom, tógfaidh mé amach leabhar pictiúirí. Tabharfaidh mé míniú mar seo don ghasúr: *"Seo leabhar lán le pictiúirí. Insíonn sé scéal deas faoi bhuachaill óg agus madra agus frog atá ina bpeataí aige. Ar dtús ba mhaith liom go n-éistfidh tú leis an scéal agus muid ag breathnú ar na pictiúirí. Ansin imeoidimid ar ais chuig tús an leabhair agus beidh seans agat féin an scéal a inseacht domsa."* Déanfar taifead fuaim ar chaint an ghasúir. Coinneofar an taifead seo faoi ghlas san Ollscoil – tá fáilte roimh na tuismitheoirí taifead a bpáiste a chloisteáil ar ndóigh.

Seisiún a 2: Measúnú éisteachta agus measúnú síceolaíochta gairid. Beidh an dá cheann seo bunaithe ar spraoi le blocanna agus pictiúirí. Ní imeoidh siad thar 15 nóiméad an ceann.

Ar deireadh, iarrfaidh mé ar thuismitheoirí ceistneoir a líonadh ar fhorbairt ghinearálta a ngasúr agus ar na teangacha a chloiseann a ngasúir. Tá sé tábhachtach go bhfuil eolas ag teiripeoirí urlabhra agus teanga ar na teangacha difriúla a chloiseann gasúr agus a c(h)umas teanga á thomhais acu.

****Má tá thuismitheoir sásta níos mó tacaíochta a thabhairt don tionscnamh seo agus páirt a ghlacadh sa scéalaíocht í/é féin bheadh sé sin iontach. Seo a leanas a bheas i gceist dóibh:**

Tógfaidh sé seo thart ar 30 nóiméad:

Déanfaidh mé taifead fuaime ar an thuismitheoir is é/í ag inseacht scéil as leabhar pictiúirí dá bpáiste/bpáistí. 'Sí canúint an thuismitheora an sampla agus an sprioc atá ag an bpáiste agus í/é ag foghlaim de réir a chéile le labhairt ar nós duine fásta. Trí thaifead fuaime a dhéanamh ar thuismitheoirí chomh maith le páistí beidh muid in ann a thomhais cé chomh gar don chaoi a labhraíonn daoine fásta an phobail is atá páistí ag aoiseanna difriúla. Tabharfaidh an t-eolas seo an-chúnamh do theiripeoirí urlabhra agus teanga agus iad ag cabhrú le páistí le deacrachtaí teanga sa nGaeltacht.

An gá do na páistí agus dá dteaghlaigh páirt a ghlacadh?

Tá sé mar aidhm ag an tionscnamh seo staidéar a dhéanamh ar ghnáthfhorbairt teanga i ngnáthghasúir Ghaeltachta. Is faoin bpáiste agus faoin thuismitheoir atá sé cinneadh a dhéanamh an ceart dóibh páirt a ghlacadh. Má shocraíonn siad nach bhfuil siad sásta páirt a ghlacadh glacfar leis seo gan argóint. Má thugann siad cead agus má athraíonn siad a n-intinn is féidir leo fós tarraingt as an taighde ag am ar bith gan cúis a thabhairt agus gan argóint. Mar an gcéanna, má tharlaíonn sé ag pointe ar bith nach bhfuil fonn ar ghasúr páirt a ghlacadh sa staidéar a thuilleadh, ní ghá dóibh leanacht ar aghaidh leis, ar ndóigh.

Cén leas a d'fhéadfadh sé a dhéanamh páirt a ghlacadh?

Níl leas díreach ar bith do na teaghlaigh nó duit féin trí pháirt a ghlacadh sa staidéar. É sin ráite, cuirfidh an staidéar seo leis an tuiscint atá againn ar ghnáthfhorbairt teanga i ngasúir le Gaeilge agus cabhróidh sé seo le teiripeoirí urlabhra agus teanga atá ag obair le gasúir atá á dtógáil le Gaeilge. Má shocraíonn sibh páirt a ghlacadh sa staidéar seo tá súil agam go mbainfidh tú féin agus na gasúir taitneamh as.

An bhfuil aon mhíbhuntáiste trí pháirt a ghlacadh?

Níl baol sláinte dá laghad sa staidéar seo do na gasúir nó d'aon duine eile. D'fhéadfadh sé tarlú go mb'fhéidir go mbeadh roinnt gasúir cineál cúthail ós comhair strainséara. Ionas go bhfaighfidh na gasúir taithí orm tabharfaidh mé cuairt ar an seomra ranga roimh chasadh leo go haonarach. Nuair a chasaim leo go haonarach tabharfaidh mé cuireadh don ghasúr roinnt pictiúirí a tharraingt agus/nó roinnt bolgán a shéideadh len iad a chur ar a gcompord.

An mbeidh na torthaí faoi rún?

Coinneofar an t-eolas ar fad a bhaileofar go hiomlán faoi rún. Ní úsáidfear ainmneacha in aon tuairisc (foilsithe nó neamh-foilsithe). Tabharfar uimhir do chuile ghasúr agus is agam féin amháin a bheidh a fhios cén uimhir a bhaineann le cén gasúr agus cén scoil / naíonra. Má tá fonn ar thuismitheoirí fáil amach faoi thorthaí a ngasúir féin níl orthu ach dul i dteagmháil liom. Tá mo shonraí teangmhála thíos.

Céard a tharlóidh do thorthaí an staidéir?

Cabhróidh torthaí an staidéar seo linn measúnú teanga a fhorbairt. Beidh torthaí an staidéir agus an mheasúnaithe seo curtha ar fáil do Theiripeoirí Urlabhra agus Teanga atá agus a bheas ag obair le

cainteoirí dúchais Gaeilge óga i nGaeltacht Chonamara. Táthar ag súil go bhfoilseofar torthaí an staidéir in iris a thabharfaidh an deis do Theiripeoirí Urlabhra agus Teanga i bpobail mionteangacha eile leas a bhaint as an taighde. Ní úsáidfear ainmneacha in aon tuairisc (foilsithe nó neamh-foilsithe) agus ní nochtfar cén t-eolas a bhaineann le cén scoil / naíonra. Má theastaíonn uait achoimre a fháil de na torthaí ag deireadh an staidéir le do thoil déan teagmháil liom. Tá mo shonraí teangmhála thíos.

Cé a rinne léirmheas ar an staidéar?

Rinne Coiste Eiticí-Taighde Ollscoil na hÉireann, Gaillimh (NUIGREC) léirmheas ar an bplean agus tá cead eiticiúil tugtha acu.

Cé leis a dhéanfaidh mé teagmháil le níos mó sonraí a fháil?

Má tá aon cheist eile agat déan teagmháil, le do thoil, liom féin nó le duine de m'fheitheoirí. Tá na sonraí teangmhála uilig thíos.

Is iad seo a leanas mo shonraí teangmhála:

Sarah-Ann Muckley Uí Chomhraí

Seoladh: An Roinn Teiripe Urlabhra agus Teanga, Áras Moyola,
OÉ Gaillimh, Bóthar an Chaisleáin Nua, Gaillimh.

Seoladh r.phost: s.muckley1@nuigalway.ie

Uimhir fóin: 091 494181 / 087610611

Is iad seo a leanas sonraí teangmhála m'fheitheoirí:

Dr. Stanislava Antonijević

Seoladh r.phost: stanislava.antonijevic@nuigalway.ie

Uimhir fóin: 091 495623

An Dr. Conchúr Ó Giollagáin

Appendices

Seoladh r.phost: conchur.ogiollagain@nuigalway.ie

Uimhir fóin: 091 595101

Má tá aon inní ort faoin staidéar seo agus má theastaíonn uait dul i dteangmháil le duine neamhspleách, is féidir dul i dteangmháil le Cathaoirleach Coiste Eiticí-Taighde Ollscoil na hÉireann Gaillimh, c/o Oifig an Leas Uachtarán Taighde, OÉGaillimh, ethics@nuigalway.ie

Arís, **go raibh míle maith agat** as an mbileog eolais seo a léamh agus as smaoineamh ar pháirt a ghlacadh sa tionscnamh tábhachtach seo. Má tá tú sásta páirt a ghlacadh sa staidéar seo, le do thoil, iarr ar thuismitheoirí na foirmeacha ceada a tháinig lena mbileogaí eolais a líonadh agus a chur ar ais chuig an naíonra/ scoil nó chugam féin.

Le beannacht,

Sarah-Ann Muckley-Uí Chomhraí

Taighdeoir agus Teiripeoir Urlabhra agus Teanga.

Seoladh: An Roinn Teiripe Urlabhra agus Teanga, Áras Moyola, OÉ Gaillimh, Bóthar an Chaisleáin Nua, Gaillimh.

R.phost: s.muckley1@nuigalway.ie

Uimhir fóin: 0876106111



Information Leaflet for Teachers

Will you support a research project based on storytelling and play during the school / preschool day which will enable improvement in the Speech and Language Therapy service available to children in the Connemara Gaeltacht?



Why?

The aim of this study is to add to understanding of typical Irish language development in children in the Gaeltacht in order to help speech and language therapists to provide a better service to children being raised through Irish if a language difficulty is suspected. This new understanding will mean that, for the first time ever, we will be able to develop an assessment tool specially designed for the Irish speaking children of Connemara.

Who?

We need help from children **between 3 and 6 years of age** who hear **Irish at home** and who are **not** receiving speech and language therapy. We also need help from their parents and teachers (more details inside). Parents can give consent for their

child to take part in the study and parents can also take part themselves (more details inside).

Me: I am a speech and language therapist who is undertaking research with support from the *National University of Ireland, Galway* and from *An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta (COGG)*.

What?

I would like to visit your school / preschool and to spend some time with the children storytelling and playing (more details inside) and to record them talking. I hope that the children really enjoy this time. Every child will receive little presents during their participation in the study. There will be questionnaires for the parents to fill out also (more details inside).

Title of the study: Language assessment for native Irish speakers: development of assessment tools for speech and language therapy practice.

Name of researcher: Sarah-Ann Muckley Uí Chomhraí.

Funding Source:

An Chomhairle um Oideachas Gaeltachta & Gaelscolaíochta (COGG).

Dear Teacher,

You and some of the children in your class / preschool and their parents are invited to participate in this study on language development in young native Irish speakers. We would like to include

Appendices

children who hear predominantly Irish in this study. This information leaflet will give information on the aims of the study and what will be asked of you, the children and their parents if you decide to take part. There are also information sheets for the parents and they will be asked to sign consent forms and return them to you.

If a parent is happy to allow their child to take part in this study they are asked to fill out the **Consent Form** that came with their information sheet and to return it to you or give it to me directly.

If a parent is not yet sure and would like more information they are asked to fill out the **Expression of Interest Form**, that came with their information sheet and to, again, to return it to you or to contact me directly. If they are happy for their child to take part in the study after having spoken with me I'll ask them to sign the Consent Form and then we can begin.

Please keep this information leaflet as a record for yourself. If you have any questions please contact me. I'll be more than happy to answer any questions you may have. My contact details are at the end of this information leaflet.

At this point I would like to sincerely thank you for taking the time to read this information leaflet and for considering taking part in this important study. Answers to frequently asked questions with regard to this study are provided below.

What is the aim of this study?

The aim of this study is to make an appropriate assessment resource available to speech and language therapists who work with young Irish speaking children in the Gaeltacht. The research is being undertaken because of the lack of information on natural language development in children who are being raised with Irish in the

Gaeltacht. The speech and language therapist depends on information on typical language development to help children who have language difficulties. This information is widely available for children who are being raised through English. However information on typical language is not available for children who are being raised through Irish. The aim of this study is to add to understanding of typical Irish language development in children in the Gaeltacht in order to help speech and language therapists to provide a better service to children being raised through Irish if a language difficulty is suspected.

Which children will be invited to take part in this study?

Children between 3 and 6 years of age, who hear mostly Irish at home and who are not receiving speech and language therapy are invited to participate in this study.

What will be involved for me as a teacher?

You will be asked to do the following:

1. To send home envelopes (in which I have put information leaflets, and forms) with some of the children in your class /preschool and, later, to collect these forms when parents return them.
2. To allow me to take part in some typical classroom / preschool activities (for example play time or story time) for a while to give the children the opportunity to get to know me.
3. To allow some children to miss classroom / preschool group activities on two occasions to take part in this study. There are more details below.

What will be involved for the children and parents?

I'll see each child individually twice in the school or preschool. These sessions will be based on storytelling and play and I will audio-record

the children speaking. I'll also ask each parent to fill out a questionnaire at home. These questions will be on the subjects of the child's general development and the language(s) they hear everyday.

**If a parent is happy to participate further in the study I'll meet with them and their child(ren) at the preschool, school at the Family Support Centre (An t-Ionad Tacaíochta Teaghlaigh) in Indreabhán or in their own home, whichever suits best. This will take about 30 minutes.

Two individual sessions with every child (each of which will last about 40 minutes):

I'll visit the classroom / preschool before working with the children individually. I'll take part in some typical classroom / preschool activities so that myself and the children can get to know each other and so that they will begin to feel comfortable with me.

Individual session 1: Retelling a story from a picture book and audio-recording.

Myself and the child will go into another room in which an audio-recording device (a small one which resembles a mobile phone) is laid on a table. I will observe the school / preschool rules with regard to working with children individually. I'll give the child crayons so that he/she can draw pictures with me for a little while. When I feel that the child is happy and comfortable with me, I'll take out a picture book. I'll give an explanation such as the following to the child. "*Seo leabhar lán le pictiúirí. Insíonn sé scéal deas faoi bhuachaill óg agus madra agus frog atá ina bpeataí aige. Ar dtús ba mhaith liom go n-éistfidh tú leis an scéal agus muid ag breathnú ar na pictiúirí. Ansin imeoimid ar ais chuig tús an leabhair agus beidh seans agat féin an scéal a inseacht domsa.*" ("This is a book full of pictures. It tells a nice story about a boy, his dog and a frog. First I'd like you to listen to the story as we're looking at the pictures. Then we'll go back to the beginning of the book and it'll be your turn to tell me the story.") The child's speech will be audio-recorded. This audio recording will be securely kept under the

Appendices

protection of a password known by the researcher alone. Of course, parents are welcome to hear the recordings of their own children.

Individual Session 2: A hearing screening and a short psychological (intelligence) assessment. These will be based on play with blocks and pictures and they won't last longer than 15 minutes each.

Finally, I'll ask parents to fill out the questionnaires on the general development of their children and the language(s) to which they are exposed on a daily basis. It is important that speech and language therapists have information on the influence of different languages that children hear when they are measuring their language ability.

**If a parent is happy to participate further in the study and take part in storytelling themselves that would be great. The following is what would be involved:

This will take about 30 minutes:

I will audio-record parents while they are telling their child(ren) a story from a picture book. The parents' dialect is their child's model and goal as he / she is gradually learning how to speak like an adult. By studying parent as well as child language we will be able to measure how close to the adult language in the community the language of children is at different ages. This understanding will be of great help to speech and language therapists in their support of Irish speaking children with language difficulties.

Do the children and parents have to participate?

The aim of this project is to study typical language development in typical Irish Gaeltacht children. It is up to each parent and child to decide whether they would like to take part. If they decide that they are not happy to take part, this will be accepted without argument. If a parent gives permission for their child to take part and later change

their mind they can withdraw permission at any time without giving a reason and without discussion. Similarly, if a child decides at any point that he /she does not wish to continue with the study anymore this decision will also be respected.

What benefits are associated with participating in this study?

Participating in this study will probably not be of direct benefit to parents or children. That said, I expect that the children will enjoy their time participating in the study. Also, the results of this study will add to our understanding of typical Irish language development and this will support speech and language therapists who are working with children who are being raised with Irish as a home language.

Is there any disadvantage associated with taking part in the study?

There is, of course, no health risk to the children taking part in this study. It is possible that some children may feel shy with me because I am a stranger to them. I will visit the classroom / preschool and engage in group activities before working with each child individually so that they will have a chance to get to know me. When I meet each child individually I'll encourage them to draw some pictures and to chat about the pictures in order to put them at their ease.

Will the children's results be confidential?

Each child's results and personal information will be kept completely confidential. Their names will not be used in any report (published or unpublished). Each child will be given a number and only I will know which number corresponds to which child, which family and which school/preschool. If parents would like to find out about their own child's results or if they would like to hear their child's audio-recording, they are very welcome to contact me. My contact details are below.

What will happen to the results of the study?

The results of this study will help us to develop a language assessment for use with Irish speaking children in the Gaeltacht. The results will be made available to speech and language therapists who are and who will be working young native Irish speakers in the Connemara Gaeltacht and in the other Gaeltachtaí around the country. We are hoping to publish the results of this study in a journal that will allow speech and language therapists in other minority language communities around the world to also benefit from this research. Neither teachers' names, the children's names nor the names of anyone in their family will be used in any report (published or unpublished). Similarly details about particular schools and preschools will also be kept confidential. If you would like to get a summary of the results at the end of the study, please, contact me. My contact details are below.

Who reviewed this study?

The National University of Ireland, Galway's Research Ethics Committee reviewed the plan for this study and gave their ethical approval.

Who can I contact to get more details?

If you have any other questions, please contact myself or one of my supervisors. The contact details are provided below .

The following are my own contact details:

Sarah-Ann Muckley Uí Chomhraí

Address: Speech and Language Therapy Dept., Áras Moyola,
NUI, Galway, Newcastle Road, Galway.

Appendices

Email: s.muckley1@nuigalway.ie

Phone: 091 494181 / 0876106111

The following are the contact details of my supervisors:

Dr. Stanislava Antonijević

Email: stanislava.antonijevic@nuigalway.ie

Phone: 091 495623

Dr. Conchúr Ó Giollagáin

Email: conchur.ogiollagain@nuigalway.ie

Phone: 091 595101

If you have any concerns about this study and would like to contact someone independent, you can contact the Chairperson of the Research Ethics Committee, National University of Ireland, Galway, c/o Office of the Vice President for Research, NUI Galway, ethics@nuigalway.ie

Again **many many thanks** for reading this information leaflet and for considering taking part in this important study. If you are happy to take part in this study please ask parents to complete the Consent Forms that came with their information leaflets and return to yourself or to me.

Le beannacht,

Sarah-Ann Muckley-Uí Chomhraí

Researcher and Speech and Language Therapist.

Address: Speech and Language Therapy Dept., Áras Moyola,
National University of Ireland, Galway, Newcastle Road, Galway.

Email: s.muckley1@nuigalway.ie

Phone: 0876106111

Appendix 2: Questionnaires in Irish and English



Ceistneoir do thuismitheoirí:

Dáta: _____

Sonraí pearsanta agus teaghlaigh

Ainm an pháiste: _____

Buachaill nó cailín: _____

Dáta breithe an pháiste: _____

Áit chónaithe (Baile fearainn agus ceantar): _____

Ainm an duine atá ag líonadh amach an fhoirm seo:

Gaol leis an bpáiste: _____

Cé atá sa mbaile?:

Céadainm	Aois	Gaol leis an bpáiste	Leibhéal oideachais: m.shampla: Teastas Sóisearach/ Ardteist/ cáilíochtaí agus an méid blianta caite ag an tríú leibhéal.	Stádas an chainteora (m.shampla: cainteoir dúchais Gaeilge/ foghlaimoir G./ Gaeilge líofa ar nós cainteoir dúchais / cainteoir Béarla aonteangach srl. agus canúint)

Appendices

Forbairt ghinearálta do pháiste

Le do thoil déan iarracht na ceisteanna seo a leanas a fhreagairt:

Toircheas agus breith:

An raibh aon deacrachtaí leis an mbreith nó roimhe sin nuair a bhí do leanbh sa mbroinn?

Meáchan breithe (birth weight): _____

Forbairt i scileana fisiciúla:

Cén aois ag a thosaigh do pháiste:

ag suí suas gan cúnamh? _____

ag siúl gan cúnamh? _____

An bhfuil nó an raibh aon deacrachtaí aige nó aici le bheith:

ag ithe? _____ ag slogadh? _____ ag cogaint? _____

ag priosláil (drooling)? _____ ag séideadh? _____ ag diúladh?

Má bhí/tá, tabhair sonraí le do thoil:

Radharc súl:

An gcaitheann do pháiste spéaclairí?

An bhfuil tú buartha faoi radharc súl do pháiste?

Cumas éisteachta:

An bhfuil tú buartha faoi chumas éisteachta do pháiste?

Cén uair go ndearnadh an scrúdú éisteachta is déanaí ar do pháiste?

Cén tortha a bhí leis?

An raibh tinneas cluaise ar do pháiste riamh?

Má bhí –an bhfuil tú in ann cuimhniú ar cén uair a tharla ...

..an chéad cheann? _____ ...an ceann is deireanaí?

Cé chomh minic is ar tharla siad? _____

Aon rud eile faoi shláinte do pháiste nó faoi chúrsaí leighis?

Forbairt urlabhra agus teanga do pháiste:

	✓ / ✗
1. An raibh teiripe urlabhra agus teanga ag do pháiste riamh? Má bhí, cén fáth? Agus an bhfuil sé fós ag dul ar aghaidh? <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/>	
2. An mbíonn sé deacair do dhaoine eile do pháiste a thuiscint mar gheall ar an mbealach go ndeireann sé/sí focla? <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/>	

Appendices

<hr/> <hr/>	
3. An bhfuil tú buartha faoi thuiscint nó caint do pháiste?	
<hr/> <hr/>	
4. An bhfuil (nó an raibh) fadhbanna cainte, teanga nó léamh ag aon duine den chlann? (má tá/bhí, céard iad na fadhbanna seo?)	
<hr/> <hr/> <hr/>	

Cén aois a bhí ag do pháiste nuair a dúirt sé/sí a c(h)éad fhocal?

i nGaeilge:

i mBéarla:

An bhfuil tú in ann cuimhniú ar chén aois a bhí ag do pháiste nuair a thosaigh sé/sí ag cur dhá fhocal le chéile?

i nGaeilge: _____

an bhfuil tú in ann smaoineamh ar shampla?:

i mBéarla: _____

an bhfuil tú in ann smaoineamh ar shampla?:

Teangacha a chuala do pháiste san am atá caite agus inniu:

Cén teanga(cha) a labhraíonn na daoine fásta i do theach lena chéile? :

Athair le máthair:

Máthair le hathair:

Daoine fásta eile:

Aon athruithe thar na blianta:

Cén teanga(cha) a labhraíonn na páistí i do theach lena chéile? :

Cén teanga a labhraíonn an páiste atá ag glacadh páirt sa tionscnamh seo leis na páistí sa chlann atá níos óige:

Cén teanga a labhraíonn an páiste atá ag glacadh páirt sa tionscnamh seo leis na páistí sa chlann atá níos sine:

Cén teanga a labhraíonn na páistí níos sine sa chlann leis an bpáiste atá ag glacadh páirt sa tionscnamh seo:

An raibh aon athruithe thar na blianta?

Le do thoil, tabhair buille faoi thuairim cén céatadán den am **a labhraíonn** do pháiste na teangacha seo sa mbaile.

Béarla? _____

Gaeilge? _____

Appendices

Cén uair gur thosaigh do pháiste ag cloisteáil Béarla go minic? (cén bealach?)

Ar chuala do pháiste Béarla ó chláracha teilifíse, raidió, leabhra agus amhráin nó eile go laethúil roimhe seo?

Cúlra teanga do pháiste

Treoracha: Tá na táblaí thíos le heolas a bhailiú ar na teangacha a chuala do pháiste thar a s(h)aol go dtí seo. Baineann gach péire thábla le tréimhse ama amháin i saol do pháiste. Le gach tréimhse nua bíonn an pháiste ag caitheamh go leor ama le duine/ daoine nua. De ghnáth d'fhéadfadh tréimhse nua tosnú nuair a thosnaíonn máthair ar ais ag obair théis saoire máithreachais a bheith aici, nuair a thosnaíonn duine nua ag tabhairt aire don pháiste nó nuair a thosnaíonn an páiste ag dul chuig an naíolann nó naíonra.

D'fhéadfadh trí nó ceithre thréimhse a bheith i gceist.

Mar shampla:

Tréimhse a 1: saoire máithreachais ó 0 go 6 mhí, b'fhéidir nach mbeadh aon duine ach a t(h)uismitheoirí agus a d(h)eartháir ag caitheamh ama le do pháiste go rialta agus seantuismitheoirí leath-lá sa tseachtain.

Tréimhse a 2: ó 6 mhí go 18 mí, seantuismitheoirí ag tabhairt aire do do pháiste fad is a bhíodh a t(h)uismitheoirí ag obair. Sa tréimhse seo smaoiníodh tú ar uaireanta a chaitheadh Mamó agus Daideo leis/léi chomh maith le uaireanta a chaitheadh mam agus dad agus an deartháir leis.

Tréimhse a 3: naíolann/creche: 18 mí go 3 bliana, ag an tréimhse seo bheadh níos mó daoine fós i gceist.

Tréimhse a 4: naíonra: 3 bliana go dtí anois.

B'fhéidir go bhfuil níos mó tréimhsí i gceist maidir le do pháiste féin nó níos lú. B'fhéidir nach bhfuil ach ceann nó dhó.

Mar shampla:

Tréimhse a 1: ó 0 go 2 bhliain: tuismitheoirí, beirt deirfiúr, aintín agus col ceathracha agus comharsa anois is arís

Tréimhse a 2: ó 2 bhliain go dtí anois: múinteoir agus páistí eile sa creche/naíolann, tuismitheoirí, beirt deirfiúr, aintín agus col ceathracha

Sna táblaí thíos baineann gach péire thábla le tréimhse difriúl i saol do pháiste.

'Séard a theastaíonn uainn anseo ná pictiúr ginearálta a fháil ar ché chomh minic is a chuala do pháiste Gaeilge agus Béarla ina s(h)aol go dtí seo. Tá sé tábhachtach go bhfuil eolas ag Teiripeoirí Urlabhra agus Teanga ar na teangacha difriúla a chloiseann gasúr agus a c(h)umas teanga á thomhais acu. Má tá ceisteanna agat nó má tá cúnamh uait cuir glaoch orm agus glaofaidh mé ar ais ort –d'fhéadfainn é a líonadh amach thar an bhfón leat dá bhfeilfeadh sé sin níos fearr duit. Go raibh míle maith agat as páirt a ghlacadh sa staidéar seo.

Appendices

Tréimhse a 1: Aois _____ go _____

Gnáthlá i rith na seachtaine (Luan go hAoine)				
Am den lá	Céard atá ar siúl ag do pháiste?	Cé leis/léi? (d'fhéadfá ainm chlár teilifíse a scríobh anseo in ionad duine) Más duine atá i gceist, le do thoil, luaigh aois an duine sin agus gaol le do pháiste.	Stádas teanga an chainteora (m.shampla: cainteoir dúchais Gaeilge/ foghlaimoir G./ Gaeilge líofa ar nós cainteoir dúchais / cainteoir Béarla aonteangach srl. agus canúint)	Cén céatadán Gaeilge/Béarla a chloiseann do pháiste ón duine seo?
Mar shampla: 5-8 ar maidin	Mar shampla: Cothú agus spraoi	Mar shampla: Mama (35 aois) agus Daide (39 aois)	Mar shampla: Cainteoir Dúchais [C.D] Gaeilge	Mar shampla: Thart ar x % Gaeilge , x % Béarla

Appendices

Appendices

Tréimhse a 1 (ar lean).

Gnáthlá ag an deireadh seachtaine				
Am den lá	Céard atá ar siúl ag do pháiste?	Cé leis/léi? (d'fhéadfá ainm chlár teilifíse a scríobh anseo in ionad duine) Más duine atá i gceist, le do thoil, luaigh aois an duine sin agus gaol le do pháiste.	Stádas teanga an chainteora (m.shampla: cainteoir dúchais Gaeilge/ foghlaimoir G./ Gaeilge líofa ar nós cainteoir dúchais / cainteoir Béarla aonteangach srl. agus canúint)	Cén céatadán (%) Gaeilge/Béarla a chloiseann do pháiste ón duine seo?

Appendices

Note: Tables identical to the above were provided to enable filling out information for 5 time periods ('tréimhse').



Questionnaire for parents

Date: _____

Personal and family details

Child's name: _____

Boy or girl: _____

Child's date of birth: _____

Child's home (townland and area): _____

The name of the person who is filling out this form:

Relationship with the child: _____

Who is at home?:

First name	Age	Relationship with the child	Level of Education: e.g.: Junior certificate/ Leaving Certificate/ qualifications and number of years spent at third level.	Speaker status (e.g.: native Irish speaker/ Irish learner./ Fluent Irish like a native speaker / monolingual English speaker etc. and dialect)

Your child's general development				

Please try to answer the following questions:

Pregnancy and birth:

Were there any difficulties with the birth or pregnancy?

Birth weight: _____

Development in physical/ motor skills:

What age was your child when he/she began to:

Sit up without help? _____

Did he or she have any difficulties...:

eating? _____ swallowing? _____ chewing? _____

drooling? _____ blowing? _____ sucking? _____

If so please give details:

Eyesight:

Does your child wear glasses?

Are you concerned about your child's eye sight?

Hearing:

Are you concerned about your child's hearing? _____

When was your child's most recent hearing assessment?

What was the result?

Did your child ever have an ear infection?

Appendices

If so – can you remember a) when the first one happened?

b) when the most recent one happened ?

How often did they happen? _____

Do you have any other comments about your child's health or medical needs?

Your child's speech and language development

	✓ / ✗
1. Did your child ever have speech and language therapy? If so, why? And is therapy ongoing? _____ _____ _____	
2. Is it difficult for others to understand your child because of the way she or he says words? _____ _____ _____	
3. Are you worried about your child's speech or understanding of language? _____	

Appendices

4. Did (or do) any member of your family have difficulties with speech, language or reading? (if so, please provide details)	

What age was your child when he /she said his /her first word?

in Irish:

in English:

Can you remember what age your child was when he / she started putting two words together?

in Irish: _____ can you think of an example?:

in English: _____ can you think of an example?:

Languages heard by your child in the past and present

Which language(s) do(es) the adults in your house speak to each other? :

Father to mother:

Mother to father:

Other adults:

Any changes over the years?:

Which language(s) do the children in your house speak to each other? :

Which language(s) do(es) the child who is taking part in this study speak with her/his younger siblings?:

Which language(s) do(es) the child who is taking part in this study speak with her/his older siblings?:

Which language(s) do the child's older siblings speak with her / him?:

Any changes over the years?

Please, estimate what proportion of the time your child **speaks** these languages at home.

English? _____

Irish? _____

When did your child begin to hear English often? (How?)

Did your child hear English from television and radio programmes, books and songs etc. daily before this?

Your child's language background

Instructions:

These tables (overleaf) are used to gather information on the language(s) your child heard so far in his or her life. Every pair of tables represents one period of time in your child's life. A new period of time begins when your child begins to spend a lot more time with someone new. Often a new 'period of time' can begin when a mother starts back to work after maternity leave, when someone new begins to take care of your child or when your child starts at creche / preschool or school.

Perhaps four periods of time are relevant to your child.

For example:

Period 1: Maternity leave from 0-6 months. Maybe only the child's parents and brother are spending time with him or her regularly during this period. Maybe grandparents spend a half day each week with the child.

Period 2: From 6 months to 18 months. Grandparents take care of the child while parents are working. Parents and brother spend time with the child when they are not working / at school.

Period 3: creche: from 18 months to 3 years, during this period more people spend time with the child frequently.

Period 4: preschool: 3 years up to present.

Perhaps more or less periods of time are relevant to your child. Maybe only one or two periods of time are relevant.

For example:

Period 1: from 0 to 2 years: parents, two sisters, aunt and cousins and also neighbours now and again.

Appendices

Period 2: From 2 years to the present: teacher and other children in the creche, parents, two sisters, aunt and cousins.

Each pair of tables (overleaf) represents one period in your child's life.

We would like to get a general picture of how often your child heard Irish and English in their lives up to this point. It is important that Speech and Language Therapists have knowledge of the amounts of the different languages a child hears when they are assessing their language. If you have questions or if you need help please call me and I'll call you back – I could fill the form out over the phone with you if that would suit you better. Thank you very much for participating in this study.

Appendices

Period 1: Age: _____ to _____

A typical day during the week (Monday to Friday)				
Time of the day	What is your child doing?	With whom? (you might name a television programme here instead of a person) If a person, please, mention the age of this person and his or relationship with your child.	Speaker status (for example: native Irish speaker/ Irish learner./ Fluent Irish like a native speaker / monolingual English speaker etc. and dialect)	What proportion of Irish and English does your child hear from this person?
For example: 5-8 in the morning	For example: Feeding and play	For example: Mama (35 now) and Daide (39 now)	For example: Native Irish speaker	For example: About x % Irish , x % English

Appendices

Period 1 (continued)

A typical day at the weekend				
Time of the day	What is your child doing?	With whom? (you might name a television programme here instead of a person) If a person, please, mention the age of this person and his or relationship with your child.	Speaker status (for example: native Irish speaker/ Irish learner./ Fluent Irish like a native speaker / monolingual English speaker etc. and dialect)	What proportion of Irish and English does your child hear from this person?

Appendices

Note: Tables identical to the above were provided to enable filling out information for 5 time periods ('tréimhse').



Teangacha a chloiseann do pháiste *faoi láthair*

Go raibh míle maith agat as an bhfoirm seo a líonadh.

Treoracha: Le do thoil, smaoinigh ar ghnáthlaethanta i saol do pháiste *faoi láthair* agus tú á líonadh. Baineann an chéad tábla le gnáthlá i rith na seachtaine agus an dá thábla eile le gnáthlaethanta ag an deireadh seachtaine. ‘Séard atá uainn ná cur síos ar ghnáthlaethanta do pháiste agus an méid Ghaeilge agus Béarla a chloiseann sé / sí. Má tá ceisteanna agat nó má tá cúnamh uait cuir glaoch orm agus glaofaidh mé ar ais ort –d’fhéadfainn é a líonadh thar an bhfón leat dá bhfeilfeadh sé sin níos fearr duit (091 494181/ 0876106111). Go raibh míle maith agat arís as páirt a ghlacadh sa staidéar seo. Coinneofar an t-eolas ar fad a thugann tú faoi rún. Tabharfar uimhir do chuile ghasúr agus ní bheidh ainmneacha luaite in aon phlé faoin tionscnamh (scríofa nó labhartha) le haon duine eile.

Appendices

Gnáthlá i rith na seachtaine (Luan go hAoine)				
Am den lá	Céard atá ar siúl ag do pháiste?	Cé leis/léi? (d'fhéadfá ainm chlár teilifíse a scríobh anseo in ionad duine) Más duine atá i gceist, le do thoil, luaigh aois an duine sin agus gaol le do pháiste.	Stádas teanga an chainteora (m.shampla: cainteoir dúchais Gaeilge/ foghlaimeoir G./ Gaeilge líofa ar nós cainteoir dúchais / cainteoir Béarla aonteangach srl. agus canúint)	Cén céatadán Gaeilge/Béarla a chloiseann do pháiste ón duine seo?
Mar shampla: 7-9 ar maidin	Mar shampla: Bricfeasta, ag spraoi agus ullmhú don lá	Mar shampla: Mam (35 anois)	Mar shampla: Cainteoir Dúchais [C.D] Gaeilge	Mar shampla: Thart ar x % Gaeilge , x % Béarla

Appendices

Gnáth Dé Sathairn				
Am den lá	Céard atá ar siúl ag do pháiste?	Cé leis/léi? (d'fhéadfá ainm chlár teilifíse a scríobh anseo in ionad duine) Más duine atá i gceist, le do thoil, luaigh aois an duine sin agus gaol le do pháiste.	Stádas teanga an chainteora (m.shampla: cainteoir dúchais Gaeilge/ foghlaimeoir G./ Gaeilge líofa ar nós cainteoir dúchais / cainteoir Béarla aonteangach srl. agus canúint)	Cén céatadán (%) Gaeilge/Béarla a chloiseann do pháiste ón duine seo?

Appendices

Appendices

Gnáth Dé Domhnaigh				
Am den lá	Céard atá ar siúl ag do pháiste?	Cé leis/léi? (nó d'fhéadfá ainm chlár teilifíse a scríobh anseo in ionad duine)	Stádas teanga an chainteora (m.shampla: cainteoir dúchais Gaeilge/ foghlaimeoir G./ Gaeilge líofa ar nós cainteoir dúchais / cainteoir Béarla aonteangach srl. agus canúint)	Cén céatadán (%) Gaeilge/Béarla a chloiseann do pháiste ón duine seo?

Appendices



The languages your child hears *at the moment*

Thank you very much for filling out this form.

Instructions: Please think about typical days in your child's life at the moment as you are filling out this form. The first table represents a typical day during the week and the other two tables, typical days at the weekend. We are looking for a picture of your child's typical days and the amount of Irish and English they hear on those days. If you have questions or you would like some help please call me and I will call you back – I could fill this form out over the phone with you if that would suit you better (091 494181/ 0876106111). Thank you very much again for taking part in this study. All the information you provide will be kept confidential. Each child will be given a number and names will not be mentioned in any discussion of the project (written or spoken) with anyone else.

Appendices

A typical weekday (Monday – Friday)				
Time of the day	What is your child doing?	With whom? (you might name a television programme here instead of a person) If a person, please, mention the age of this person and his or relationship with your child.	Speaker status (for example: native Irish speaker/ Irish learner./ Fluent Irish like a native speaker / monolingual English speaker etc. and dialect)	What proportion of Irish and English does your child hear from this person?

Appendices

Appendices

A typical Saturday				
Time of the day	What is your child doing?	With whom? (you might name a television programme here instead of a person) If a person, please, mention the age of this person and his or her relationship with your child.	Speaker status (for example: native Irish speaker/ Irish learner./ Fluent Irish like a native speaker / monolingual English speaker etc. and dialect)	What proportion of Irish and English does your child hear from this person?

Appendices

Appendices

A typical Sunday				
Time of the day	What is your child doing?	With whom? (you might name a television programme here instead of a person) If a person, please, mention the age of this person and his or relationship with your child.	Speaker status (for example: native Irish speaker/ Irish learner./ Fluent Irish like a native speaker / monolingual English speaker etc. and dialect)	What proportion of Irish and English does your child hear from this person?

Appendices

Appendices

Appendix 3: Purpose and Procedure of each subtest of the *Wechsler Preschool and Primary Scale of Intelligence – Third Edition UK (WPPSI-III^{UK})* used in the study.

Block Design

This subtest is ‘designed to measure the ability to analyze and synthesise abstract visual stimuli’ (Wechsler 2002c). For each item in this subtest the child is asked ‘to view a constructed model or a picture in a Stimulus Book, and use one or two-color blocks to re-create the design within a specified time limit’ (Wechsler 2002c).

Object Assembly

This subtest is ‘designed to assess visual-perceptual organization, integration and synthesis of part-whole relationships, nonverbal reasoning and trial-and-error learning’ (Wechsler 2002c). For each item in this subtest ‘the child is presented with a standardised configuration of puzzle pieces, and allowed 90 seconds to fit the pieces together to form a meaningful whole’ (Wechsler 2002c).

Matrix Reasoning

This subtest is ‘designed to provide a reliable measure of visual information processing and abstract reasoning skills’ (Wechsler 2002c). For each item in this subtest, the child is asked to look at an incomplete matrix and select the missing piece from four or five response options.

Picture concepts

This subtest is designed to measure ‘abstract, categorical reasoning ability’ (Wechsler 2002c). For each item of this subtest, the child is presented with two or three rows of pictures and is asked to choose ‘one picture from each row to form a group with a common characteristic’ (Wechsler 2002c).

Appendix 4: Stories 1 and 2 in Irish (and their translation to English) and the corresponding pictures.

Story 1: Irish

1. Uair amháin bhí buachaill ann agus bhí frog agus mada mar pheataí aige.
2. Gach oíche chuireadh sé an frog a chodladh i gcrúsca mór ina sheomra codlata.
3. Ach oíche amháin nuair a bhí sé féin agus a mhada ina gcodladh, léim an frog ón gcrúsca agus amach an fhuinneog leis.
4. An mhaidin dár gcionn, bhí iontas orthu feiceáil go raibh an frog imithe.
5. Bhreathnaigh an buachaill isteach ina bhuataisí ach ní raibh an frog ann.
6. Agus bhí an mada ag cuartú an frog freisin ach nuair a thriáil sé breathnú isteach sa gcrúsca chuaigh a chloigeann i bhfostú ann.
7. Ghlaigh an buachaill amach an fhuinneog “A fhroig, frog, cá bhfuil tú?”.
8. Luigh an mada amach thar an bhfuinneog freisin agus an crúsca fós ar a chloigeann aige.
9. Ach bhí an crúsca chomh trom sin gur thit an mada ar mhullach a chinn amach an fhuinneog.
10. D’árdaigh an buachaill an mada le bheith cinnte go raibh sé ceart go leor.
11. Ní raibh an mada gortaithe ach bhí an crúsca briste ina smidiríní.
12. Ní raibh an buachaill sásta leis an mada ach bhí an mada sásta mar ní raibh an crúsca ar a chloigeann a thuilleadh.
13. Chuaigh an buachaill agus an mada amach i dtreo na gcrainnte a bhí in aice le teach an bhuachalla.
14. Ghlaigh an buachaill amach arís “A fhroig, tá muid ag tíocht le tú a chuartú, cá bhfuil tú?”

Appendices

15. Ghlaoiigh an buachaill isteach i bpoll a bhí sa talamh an fhad is a bhí an mada ag léimt suas agus ag cur as do roinnt beacha a bhí thuas i nead beiche thuas i gcrann.(bzzzzz)
16. Go tobann, chuir lucháin olc a chloigeann amach as an bpoll agus bhain sé plaic as srón an bhuachalla.
17. An fhad is a bhí sé sin ag tarlú bhí an mada fós ag cur as dho na beacha bochta.
18. Bhí sé ag léimt suas agus ag tafann orthu. (woof woof)
19. Leag an mada an nead beiche ón gcrann agus d'eitil na beacha uilig amach aisti.
20. Bhí na beacha olc leis an mada mar scrios sé a dteach.
21. Ach ní raibh an buachaill ag tabhairt aon aird ar an mada.
22. Bhí poll mór tugtha faoi dearadh aige thuas i gcrann.
23. Mar sin suas leis sa gcrann agus ghlaoiigh sé isteach sa bpoll “A fhroig, frog, an bhfuil tú istigh ansin?!”
24. Ach ní frog a bhí sa bpoll ach ulcabhán mór donn.
25. Go tobann, d'eitil an t-éan mór amach as an bpoll agus leag sé an buachaill ar a dhroim ar an talamh.
26. Rith an mada thairis chomh tapaidh agus a bhí sé in ann mar bhí na beacha uilig ina dhiaidh.
27. Rith an buachaill ón ulcabhán chomh fada le carraig mhór.
28. Suas leis ar an gcarraig agus ghlaoiigh sé amach arís “A Fhroig, cá bhfuil tú?!”
29. Rug sé greim ar roinnt craobhachaí ionas nach dtitfeadh sé.
30. Ach ní craobhachaí a bhí iontu dáiríre ach adharca fia.
31. O! Go bhfóire Dia orainn bhí an buachaill i bhfostú ar chloigeann an fhia mhóir!
32. Ansin thosaigh an fia ag rith leis an mbuachaill fós i bhfostú ar a chloigeann aige.
33. Rith an mada in éindí leo.
34. Go tobann, chonaic an fia aill.
35. Stop sé ag rith agus thit an buachaill agus an mada thar imeall na haille.

Appendices

36. Bhí lochán uisce faoi bhun na haille agus thit siad isteach i mullach a chéile.
37. Nach ann a bhí an splais mór uisce!
38. Go tobann chuala an buachaill rud éigin taobh thiar dho chrann a bhí sa lochán.
39. “Shhh!” a dúirt sé leis an mada, “airím rud éicint,
40. “tá mé chun breathnú taobh thiar dhon chrann”.
41. Go deas réidh bhreathnaigh siad taobh thiar dhon chrann
42. Agus cé a bhí ann ach frog an bhuachalla.
43. Agus bhí mamaí frog in éindí leis.
44. Bhí roinnt frogannaí beaga ann freisin.
45. “Ó sin áit ina bhfuil tú!” a dúirt an buachaill “agus tá frogannaí beaga agat freisin!”
46. Léim ceann dho na frogannaí beaga i dtreo an bhuachalla.
47. Thaitnigh an buachaill leis an bhfrog beag seo agus bhí sé ag iarraidh dhul abhaile leis agus a bheith mar pheata aige.
48. Bhí an buachaill agus an mada an-an-sásta peata nua a bheith acu.
49. Nuair a bhí an buachaill ag imeacht óna sheanchara agus a chlann nua, dúirt sé “slán, tabharfaimid aire mhaith dhó”.

Introduction to Story 2:

An cuimhin leat go ndeachaigh ceann de na frogannaí beaga abhaile leis an mbuachaill. Bhuel seo d’iad na frogannaí beaga eile, a dheartháireachaí agus dheirfiúrachaí ...

Story 2:

1. Tá siad brónach.
2. Airíonn siad a ndeartháir uathu.
3. Ba mhaith leo a ndeartháir a fheiceáil.
4. Tosnaíonn péire acu ag smaoineamh, “b’fhéidir go bhféadfadh muid dhul ar cuairt chuige”.
5. An mhaidin dár gcionn, éríonn siad as a leapacha.

Appendices

6. Cuireann siad orthu a mbuataisí dubha.
7. Tógann sise a bláth léi agus tugann sí a mhála dhó.
8. Le chéile, léimeann siad thar chraobh mhór amháin agus imíonn siad faoi cheann eile atá i bhfad níos mó ná an chéad cheann.
9. Téann siad trí lochán uisce.
10. Téann siad suas cnoc.
11. Téann siad idir dhá chrann mhóra.
12. Agus ar a mbealach feiceann siad an fia mór, an t-ulcabhán donn, na beacha bochta agus an lucháin olc.
13. Chomh maith leo siúd, feiceann siad cait, caoirigh, agus capla.
14. Faoi dheireadh, tagann siad ar theach an bhuachalla.
15. Agus tá siad chomh sásta a ndeartháir a fheiceáil.
16. Suíonn siad ag ithe seacláide lena ndeartháir agus a chairde nua, an buachaill agus an mada. (yum yum yum).
17. Agus iad ag imeacht, deireann siad “slán, tiocfaimid ar ais arís go luath agus an chéad uair eile tabharfaimid Mamaí agus Daidí linn!”

Story 1: translation to English

1. Once there was a boy who had a dog and a frog as pets.
2. Every night he used to put the dog to bed in a big jar in his bedroom.
3. But one night when himself and his dog were asleep the frog jumped out of the jar and went out the window.
4. The next morning, they were surprised to see that the frog was gone.
5. The boy looked in his boots but the frog wasn't there.
6. And the dog was looking for the frog too but when he tried to look inside the jar his head got stuck in it.
7. The boy called out the window “Frog, frog where are you?!”
8. The dog leaned out the window too with the jar still stuck on his head.
9. But the jar was so heavy that the dog fell head first out the window.
10. The boy lifted up the dog to make sure he was ok.
11. The dog wasn't hurt but the jar was broken into little pieces.

Appendices

12. The boy wasn't happy with the dog but the dog was happy because the jar wasn't stuck on the head anymore.
13. The boy and the dog went out towards the trees that were beside the boy's house.
14. The boy called out again "frog, we're coming to look for you, where are you?"
15. The boy shouted into a hole that was in the ground while the dog was jumping up and annoying some bees up in a beehive in a tree.
(bzzzz)
16. Suddenly an angry mouse popped his head out of the hole and bit the boy's nose.
17. While that was happening the dog was still annoying the poor bees.
18. He was jumping up and barking at them. (woof woof)
19. The dog knocked the beehive from the tree and all the bees flew out.
20. The bees were angry with the dog because he'd ruined their home.
21. But the boy wasn't paying any attention to the dog.
22. He'd noticed a big hole up in a tree.
23. So up he went into the tree and he shouted into the hole "frog, frog are you in there?!"
24. But it wasn't frog that was in the hole.
25. It was a big brown owl.
26. Suddenly the big bird flew out of the hole and knocked the boy on his back on the ground.
27. The dog ran past him as quick as he could because all the bees were chasing him.
28. The boy ran from the owl as far as a big rock.
29. Then up he went on the rock and called out again "frog, where are you?!"
30. He grabbed hold of some branches so that he wouldn't fall.
31. but they weren't really branches.
32. They were a deer's antlers.
33. Oh no! the boy was stuck on the big deers head!
34. Then the deer started running with the boy still stuck on his head.
35. The dog ran along beside them.

Appendices

36. Suddenly the deer saw a cliff.
37. He stopped running and the boy and the dog fell over the edge of the cliff.
38. There was a little lake under the cliff and they fell in on top of each other.
39. And there was a big splash!
40. Suddenly the boy heard something behind a tree that was in the lake.
41. “Shhh!!” he said to the dog “I hear something.”
42. “I’m going to look behind the tree.”
43. Nice and quietly they looked behind the tree.
44. And who was there but the boy’s frog.
45. And he had a mommy frog with him.
46. There were some baby frogs too.
47. “Oh that’s where you are” said the boy “and you have baby frogs too!”
48. One of the baby frogs jumped towards the boy.
49. He really liked the boy and wanted to go home with him and be his pet.
50. The boy and his dog were really happy to have a new pet.
51. When the boy was leaving his old friend and his new family he said “bye, we’ll take good care of him.”

Introduction to Story 2:

Do you remember that one of the baby frogs went home with the boy? Well these are the other baby frogs, his brothers and sisters ...

Story 2:

1. They’re sad.
2. They miss their brother.
3. They want to see him.
4. Two of them start to think “maybe we could go and visit him.”
5. The next morning, they get out of their beds.

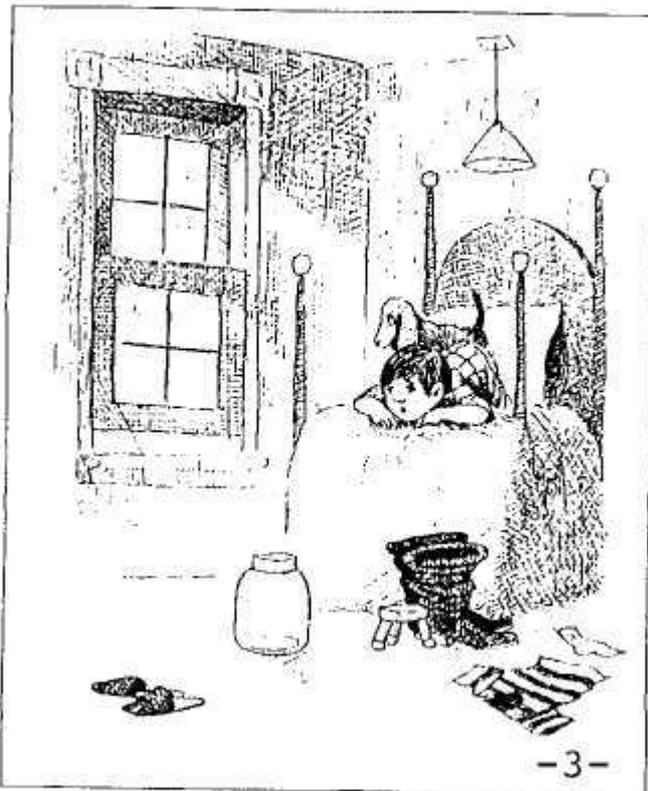
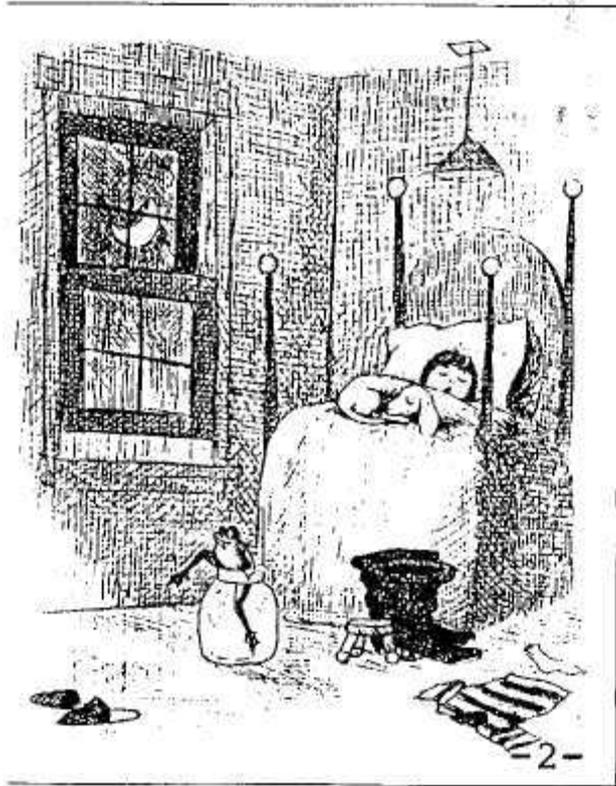
Appendices

6. They put on their black boots.
7. She takes her flower with her and gives him his bag.
8. Together, they jump over a big branch and they go under another one that's much bigger than the first one.
9. They go through a little lake.
10. They go up a hill.
11. They go between two big trees.
12. And on their way they see the big deer, the brown owl, the poor bees and the angry mouse.
13. As well as those, they see cats, sheep and horses.
14. At last they come to the boy's house.
15. And they're so happy to see their brother.
16. They sit eating chocolate with their brother and his new friends the boy and the dog. (yum yum yum)
17. As they're leaving, they say "bye, we'll come back again soon and next time we'll bring Mammy and Daddy with us!"

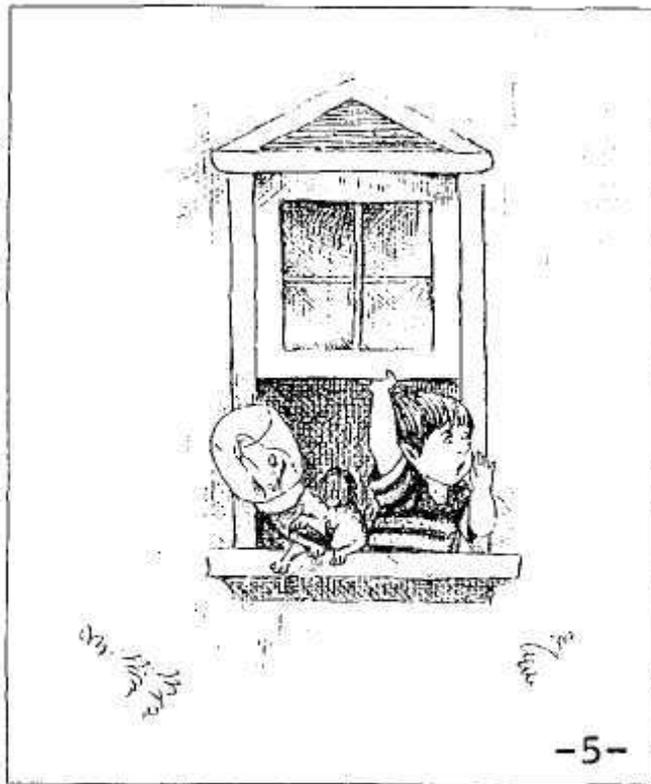
Story 1

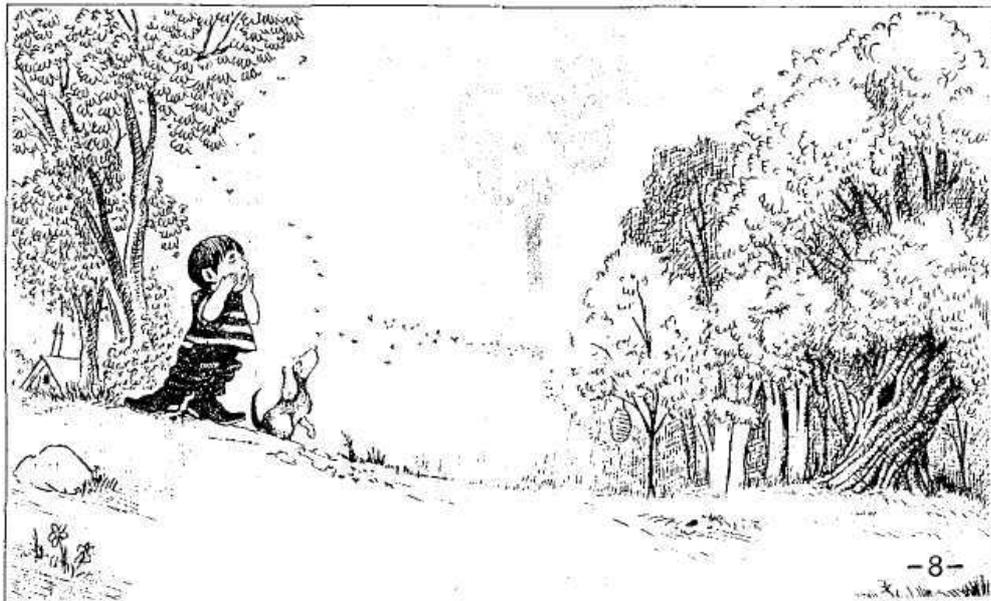


1.



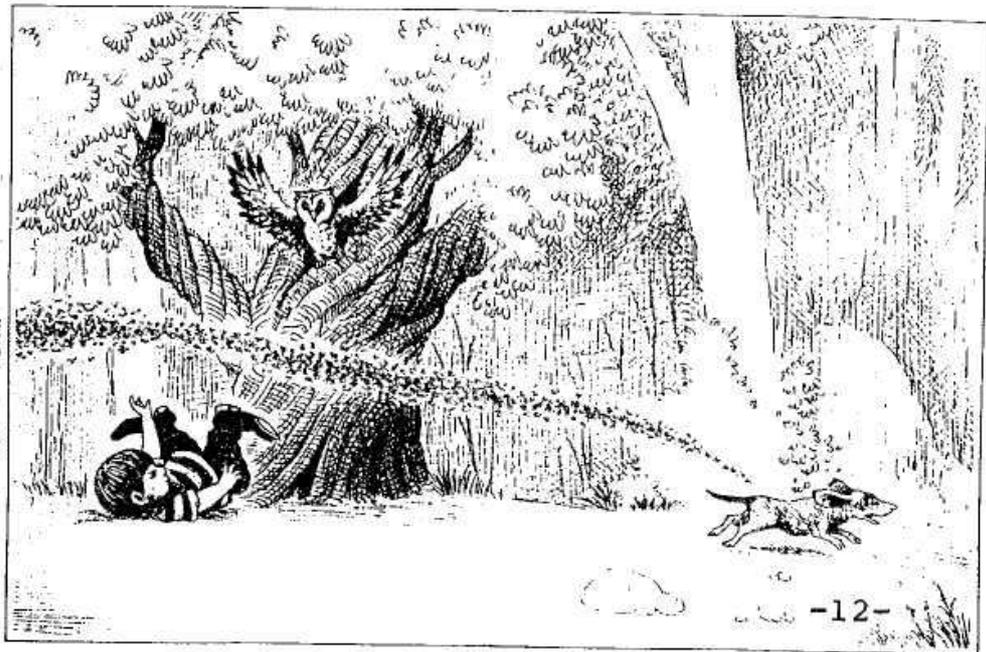
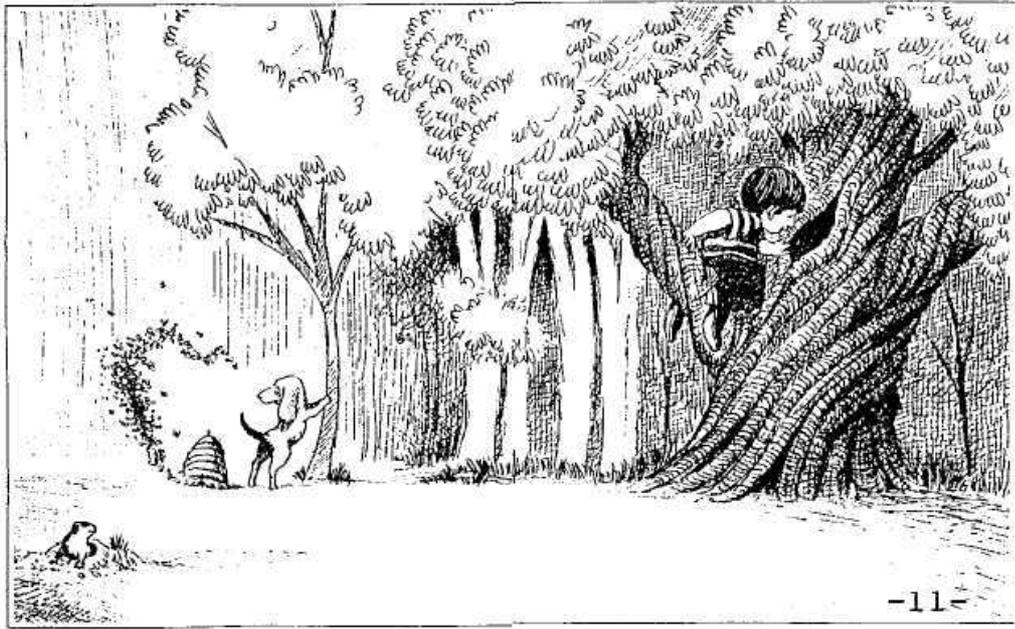








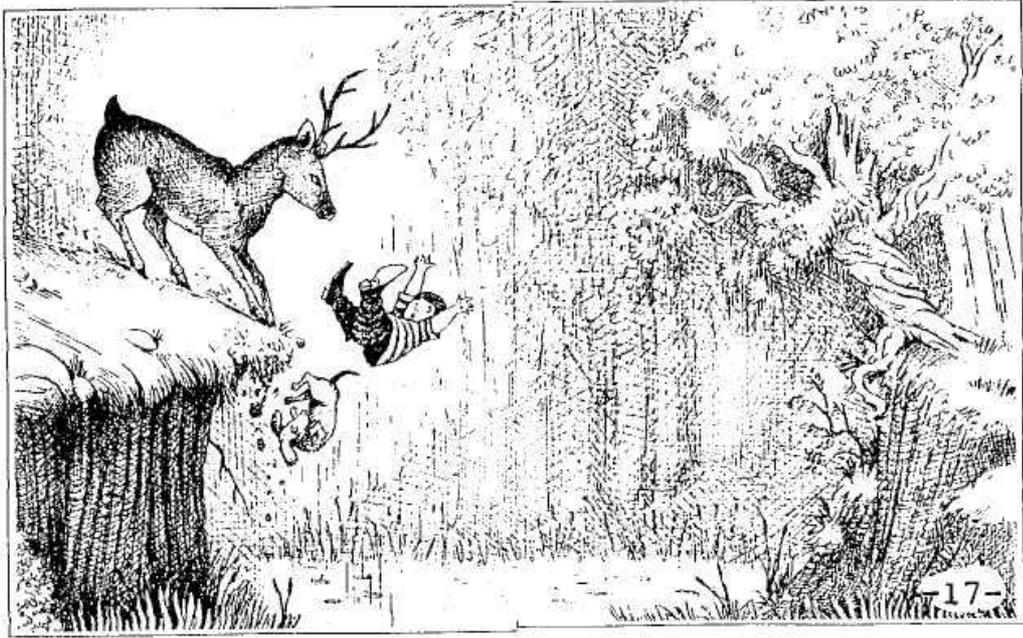
Appendices





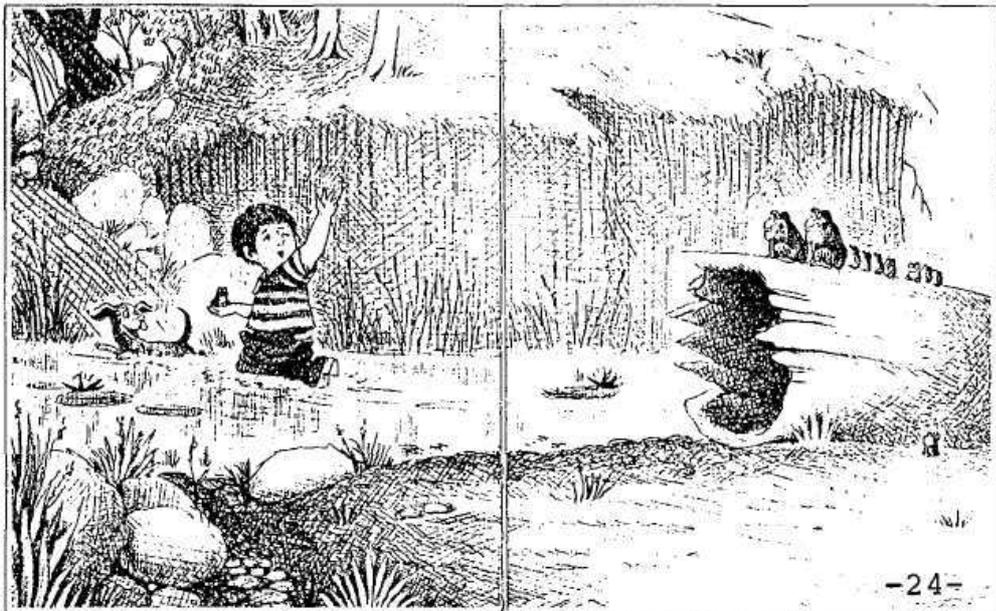


Appendices



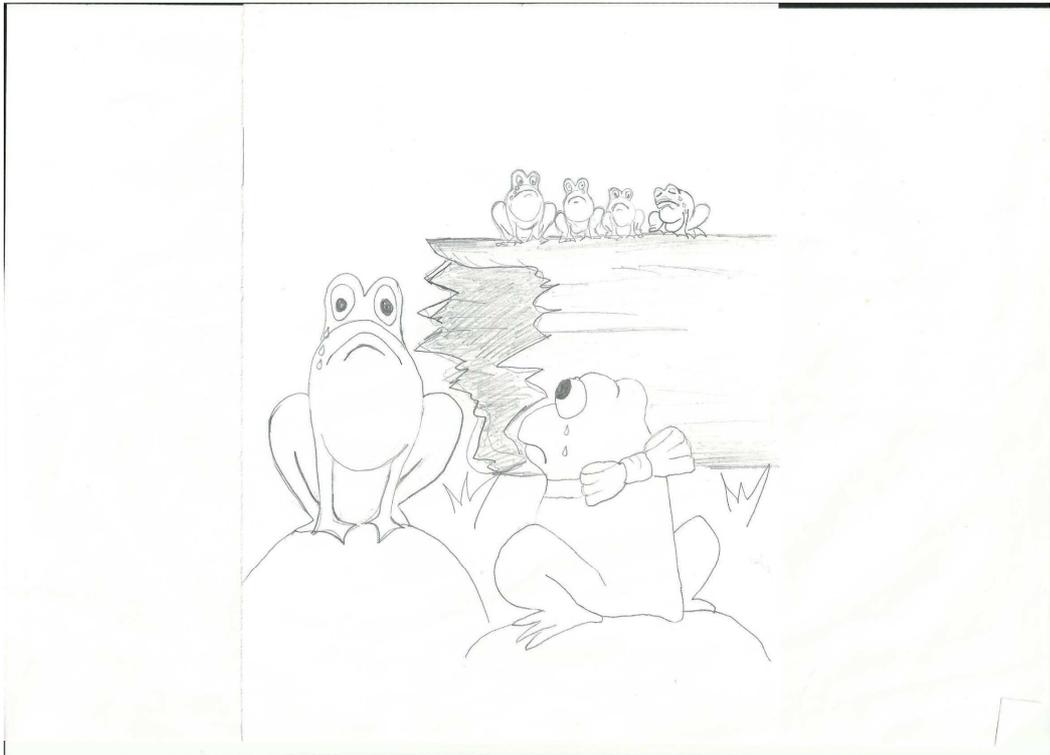




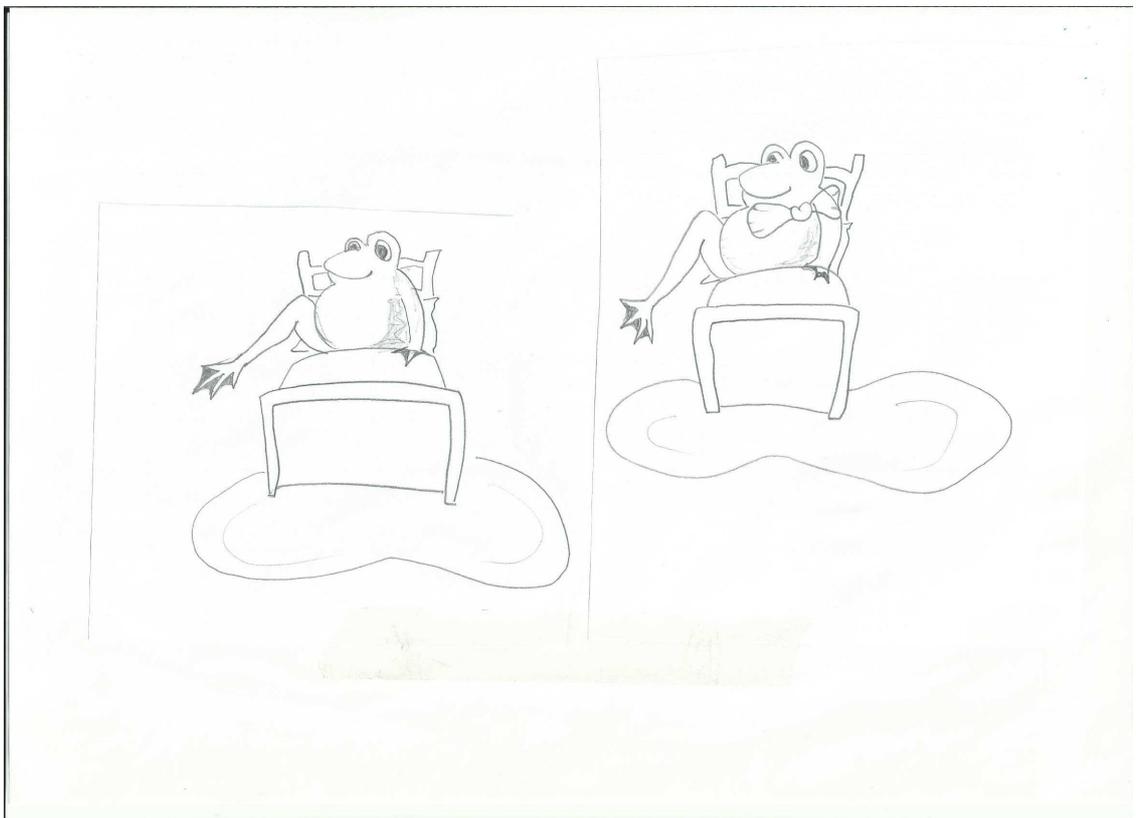


Appendices

Story 2



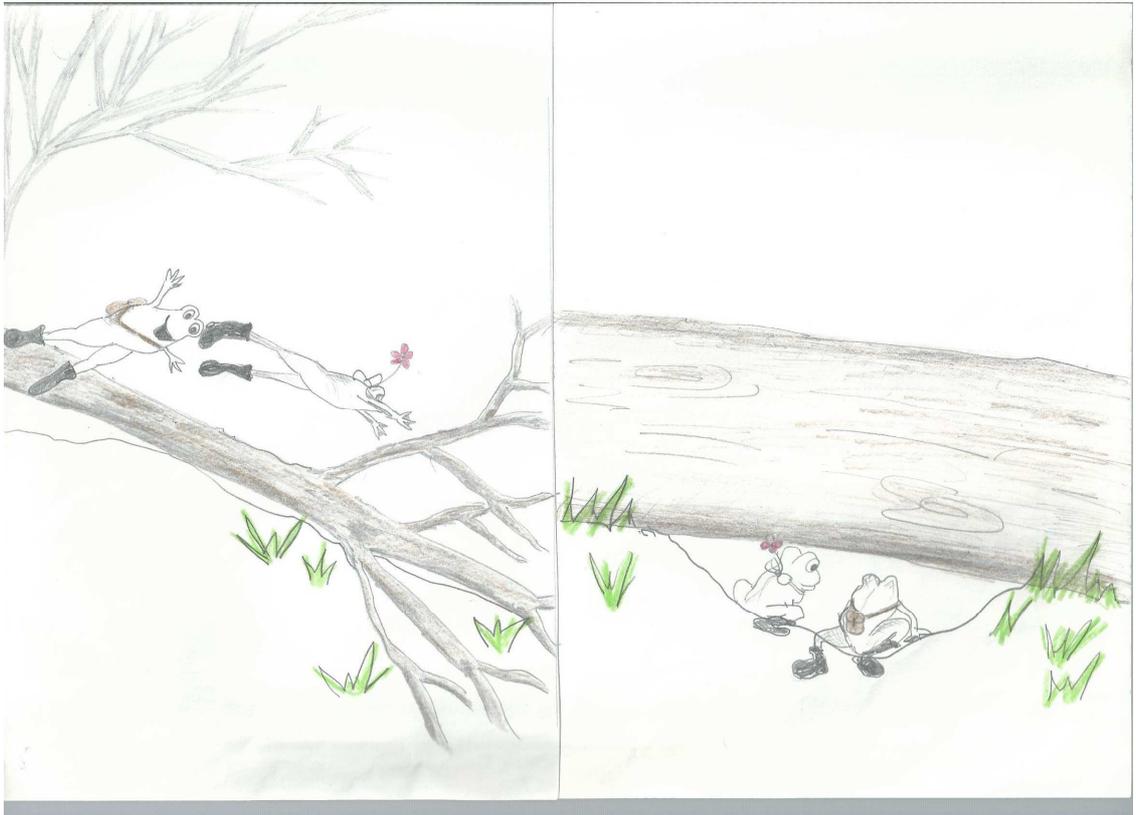
Appendices



Appendices



Appendices





Appendices



Appendices



Appendices



Appendix 5: Utterance segmentation and other transcription conventions

Utterance segmentation

Transcription involved breaking speech into utterances. Each main line comprised one utterance only. Utterances are not as easily delineated as sentences which are segmented by grammar alone or conversation turns which, being flanked by the turn(s) of another speaker, are easily identified. A close link between tone units and ideational units has been demonstrated (Chafe, 1980; Jefferson, 1984). So, to identify utterances, transcribers relied on the interplay of three elements: grammar, pause and intonation. In example 1¹² below, grammar and (final falling) intonation indicated that it be transcribed as a single utterance despite a short word-searching pause before the final noun. In example 2, grammar, intonation (a level then rise and fall contour) and pausing indicated that it be transcribed as a single utterance with two clauses rather than two utterances with one clause each.

1. *Léim an frog amach as an (.) crúsca.*

‘The frog jumped out of the ... jar.’

2. *Dúirt sé → [clause 1] (.) ‘cá bhfuil tú ↑ ↓?’ [clause 2]*

‘He said [clause 1] “where are you?” [clause 2].’

If a conjunction was omitted, as in example 3, grammar took precedence over pausing and intonation in guiding segmentation, and clauses were transcribed as separate utterances.

3. *Bhí an mada ag tafann leis na beacha → [clause 1] chlimbáil an leaidín suas an crann ↓ [clause 2]*

‘The dog was barking at the bees [clause 1] and the little lad climbed up the tree [clause 2].’

¹² All examples from the transcripts, in any language, are presented in italics. Translations are presented within single quotation marks.

Appendices

When conjunctions were included in multi-clause sentences the decision of where one utterance ended and the next began became more complicated. For example, in the grammatically acceptable example 4 below, where it was necessary to decide whether segmentation should result in one utterance with two clauses or two utterances with one clause each, pausing and intonation guided segmentation.

4. *Bhí an mada ag tafann leis na beacha* → [clause 1] *agus chlimbáil an leaidín suas an crann* ↓ [clause 2]

‘The dog was barking at the bees [clause 1] and the little lad climbed up the tree [clause 2].’

Details of the decision making process used for the segmentation of utterances when faced with conjunction joined clauses are provided below.

Pausing

Agus (‘and’) was considered a special case of conjunction because it is relatively early developing and carries a relatively general and low semantic load. For these reasons children often used *agus* almost as a filler, for example, some children began almost every new idea or clause with *agus* or *agus ansin* (‘and then’). In these cases, if the whole story had been transcribed as one long utterance, readability would have been compromised and MLU scores would have been very misleading. It was therefore decided that an utterance boundary would occur where a pause of two seconds or longer arose immediately before or after the conjunction *agus*. If no such pause existed intonation was considered as a conclusive guide to utterance segmentation. At the same time, an upper limit of two clauses joined by *agus* was allowed in each utterance irrespective of intonation (Paul, 2007).

If other conjunctions (e.g. *ach*: ‘but’; *mar*: ‘because’) were preceded by a pause of two seconds or longer, segmentation into two separate utterances with one clause each was carried out. However, pauses adjacent to conjunctions were not always indicators of utterance boundaries. If a pause of two seconds or longer followed one of these other conjunctions then

Appendices

intonation was considered as the definitive guide for utterance segmentation. Similarly, if no such pause was adjacent to a conjunction, intonation was also consulted as the definitive guide.

Intonation

In order to use intonation as a guide for utterance segmentation it was necessary to consider typical intonation patterns and then to investigate whether, according to these intonation patterns, clauses formed part of a single utterance.

Typical intonation patterns (Ransom, 1986):

- Intonation usually falls coming towards the end of an utterance.
- Questions, however, often have a rising intonation at the end.
- Utterances with more than one idea or clause usually have a low rise then fall contour or a level then fall contour.

Lists were considered exceptional cases. There is often a sharp rise in each element in the list except the last which has a low or falling contour.

e.g. I like ↑blue, ↑green, ↑purple and ↓yellow.

Children sometimes produced run on sentences in which each clause joined by *agus* or *agus ansin* had intonation contours similar to each elements in the above list. i.e. a sharp rise in each clause in the sentence except the last clause which had a low or falling contour.

e.g. *léim ceann amháin isteach i lochán↑ agus ansin bhí siad beagnach ann↑ agus chonaic siad an reindeer↑ agus ansin shroich siad teach an bhuaichail↓.*

‘one jumped into a puddle↑ and then they were almost there↑ and they saw the reindeer↑ and then they got to the boys house[↓].’

In such cases each clause was segmented into separate utterances as below.

CHI: *léim ceann amháin isteach i lochán↑*

Appendices

‘one jumped into a puddle’

CHI: *agus ansin bhí siad beagnach ann*↑

‘and then they were almost there’

CHI: *agus chonaic siad an reindeer* ↑

‘and they saw the reindeer’

CHI: *agus ansin shroich siad teach an bhuachaill* ↓

‘and then they got to the boy’s house.’

Other transcription conventions

In order to maximise systematicity and therefore clarity and reliability across transcriptions and transcribers, transcription conventions used in this study are based on the Codes for the Human Analysis of Transcripts (CHAT) transcription format. ‘Main line’ orthographic transcription ensured readability while the addition of comments and coding of phonology, word count, proposition and t-unit segmentation and grammar on secondary tiers ensured sufficient clarity.

In the main transcription line, the following shorthand was used in addition to orthographic transcription.

Three exes: **xxx** : denotes an unintelligible word.

Two exes: **xx** : denotes an unintelligible word included in count of word counts.

Curved brackets surrounding part of a word: **(te)xt**: means that a portion of a word is omitted e.g. in *a(g)* the second sound is omitted.

A single forward slash in square brackets: **text [/] text**: indicates repetition of the immediately preceding word e.g. *frog [/] frog*.

A multiplication sign and a number enclosed in square brackets: **text [xN]** : denotes multiple repetition e.g. *ar [x3]* denotes three repetitions of the word *ar*.

Text enclosed in angled brackets and followed by a single forward slash enclosed in square brackets: **<text> [/] text**: means that the text enclosed in angled brackets is repeated.

Appendices

Two forward slashes enclosed in square brackets: [//]: denotes self correction of the immediately preceding word.

Text enclosed in angled brackets and followed by two forward slashes enclosed in square brackets: <text> [//] text : denotes self correction of all text in angled brackets

Three forward slashes enclosed in square brackets: [///]: denotes total reformulation of the message without any specific corrections e.g. when none of the material included in the second attempt is present in the first attempt.

Two commas: ,, : denotes an oncoming tag question.

A single full stop in curved brackets: (.) : denotes a short length pause.

Three full stops in curved brackets: (...) : denotes a long length pause of two seconds or more.

A question mark: ? : indicates rising intonation in a question.

An exclamation mark: ! indicates emphatic intonation.

A full stop: . : indicates final falling intonation.

A down arrow followed by a question mark: ↓ ? : indicates a falling intonation in a question context.

An up arrow followed by a down arrow: ↑↓ : indicates a rise fall intonation contour.

A down arrow followed by an up arrow: ↓↑ : indicates a fall rise intonation contour.

An across arrow followed by a down arrow: →↓ : indicates a level then fall intonation contour.

An at sign followed by the letter 'e' appended to a word: @e : indicates a word with at least an English language stem.

Coding

Secondary tiers added clarity to the readable orthographic mainline of transcription. Secondary tiers also allowed coding of length and the frequency of and errors in grammatical structures. Below is a list and explanation of the secondary tier headings used in this study.

Appendices

%com: The comment line used to give background information such as indicating that the speaker made a gesture, action or facial expression or that the immediately preceding orthographic line(s) was an example of rote-learned language such as a song or rhyme. Such rote-learned lines were not included in analysis of grammar, productivity or vocabulary.

%wor: The lengths of utterance, t-units and propositions in number of words were recorded on this line.

%gra: The labels and accuracy of grammatical structures for which obligatory contexts existed were recorded on this line.

%csn: The labels of multi-clause syntax structures were noted on this line.

%pho: Finally, when judged to be potentially significant, the pronunciation of a word or phrase was recorded in this line.

Despite transcription being based on CHAT, all coding of language measures and calculations of performance were carried out manually because, to date, no Computerised Language Analysis (CLAN) -like tools have been developed for the Irish language. The Irish language has particular morphological characteristics (as described in introduction) which mean that tools created for English, for example, are not readily adaptable for use with Irish e.g. Irish nouns and verbs can change internally depending on case, tense etc.

Appendix 6: Further detail on language measures.

Productivity and Multi-clause Syntax language domains:

Why consider t-units, propositions and utterances?

Counts relating to syntactic units: (Number of Words in T-Units; Number of Words in Propositions; Number of Words in Utterances; Number of T-Units; Number of Propositions; Number of Utterances; Mean Length of Propositions in Words; Mean Length of T-Units in Words; Mean Length of Utterances in Words).

In both Productivity and Multi-clause Syntax language domains, multiple complementary measures of length are investigated. Multiple measures of each language domain allow detailed description and analysis of language and strengthen conclusions drawn with regard to domains of language. The reasons for employing t-units, utterances and propositions in this study are explained below.

T-units and propositions are relatively reliably counted, delineated, as they are, by grammar alone. Propositions are particularly simple and reliable to count. Additionally, a count of the number of propositions gives a picture of the number of events referred to in a narrative, irrespective of the child's performance in multi-clause syntax and the measure Mean Length of Propositions (MLP) in Words gives a picture of how detailed language is with regard to within clause elaboration and therefore irrespective of multi-clause syntax.

Utterances, on the other hand, are segmented using a more subjective and therefore potentially less reliable method based on pause length, pause location and intonation as well as grammar. However, considering utterances is also useful because it enables credit to be given for non-clausal elements. Non-clausal elements such as exclamations and labelling often fulfill an important function of progressing a narrative e.g. *frog* ; *agus na baby cinn*; *wheee!*; *yeh!* Additionally, if these non-clausal elements are

Appendices

ignored and only the Mean Length of clausal elements (t-units and propositions) are calculated then there is a danger that some children could be assigned misleadingly high mean length scores. Furthermore, when utterances are considered, the influence of the use of the conjunction *agus* / ‘and’ on length measures (both Mean Length ... and Number of Words ...) is captured. Propositions comprise single clauses and t-units do not include clauses joined by *agus* / ‘and’. Nevertheless, if only utterances were included in productivity counts of total syntactic units in story (i.e. if Number of Utterances was calculated and not Number of T-Units and Number of Propositions)– then children with more multi-clause syntax would appear less productive than they are.

Counts of words in t-units, propositions and utterances

(Number of words in T-Units, Number of Words in Propositions; Number of Words in Utterances; MLP in Words; MLU in Words; MLT-U in Words)

Most words counted were intelligible but others, although unintelligible, were still counted as words because they were said deliberately and clearly rather than mumbled. This clarity led the researcher to believe that the child used a particular phonological construction to represent a particular concept. That the researcher did not succeed in deciphering which concept was meant was not considered to compromise its ‘word’ status.

The conjunction *agus* / ‘and’ joining two clauses was neither included in counts of Number of Words in Propositions nor Number of Words in T-Units but was included in Number of Words in Utterances. Other conjunctions e.g. *ach* / ‘but’ , *mar* / ‘because’ were included in counts of words in propositions, t-units and utterances. In the case of coordinate sentences, the conjunctions *ach* / ‘but’, *agus* / ‘and’ and *nó* / ‘or’ were included at the beginning of a following t-unit.

Many two element phrases are counted as only one word each e.g. *in aice* ‘beside’; *in ann* ‘able’, *ar fad* ‘all’, *ós cionn* ‘on top’; *ar nós* ‘like’; *go leor* ‘a lot’, *ar buile* ‘angry’, *in éineacht* ‘in the company’, *go dtí* ‘towards’, *ar*

Appendices

ais ‘back’, *ar bith* ‘at all / whatsoever. Also sound effects e.g. *bzzz* and *ruf ruf* counted as one word each. Phrases such as *i bhfostú* and *ag rith* (or any verbal noun) which are often pronounced as one unit are only counted as two separate words if they are clearly produced as two. Some two element phrases e.g. *i ndiaidh*, *an-sásta* are counted as two separate words because each element is considered to be productive in the age group i.e. *ina dhiaidh* and *an-tuirseach* are also common in young children.

Only one repetition was counted in order to credit the use of emphasis while avoiding assigning a misleadingly large word count.

e.g. *bhí sé ag rith agus ag rith (agus ag rith agus ag rith)* ‘he was running and running (and running and running)’

Finally, with regard to lists, a maximum of three single nouns representing single concepts were counted. If lists were longer than this the remaining items were not included in counts of words.

Proposition segmentation was based on events (Reilly *et al.*, 2004).

Examples are provided below.

(Is) éan a bhí sa bpoll / (Is) frog a bhí ann.

‘(It’s) a bird that was in the hole / (It’s) a frog that was there.

2 Propositions [2 events] [relative clause]

Céard a bhí ann ach frog.

What (that) was there but (a) frog.

2 Propositions [2 events] [pseudo-cleft construction + relative clause]

Céard atá ann?

What (that) is there?

2 Propositions [2 events] [copular fronting + relative clause]

Cén áit a bhfuil tú?

Which place are you?

2 Propositions [2 events] [copular fronting + relative clause]

Thosaigh sé ag béiceach isteach i bpoll.

Appendices

He started shouting into the hole.

1 Proposition [1 event] [verbal noun complement clause]

Bhí an gadhar a(g) léim suas breathnú istigh teach le na beachainní.

The dog was jumping up looking inside the house of the bees.

2 Propositions [2 events] [verbal noun complement clause]

Thosaigh sé ag béiceach “frog”.

He started shouting “frog”.

1 Proposition [1 event] [verbal noun complement clause].

Thosaigh sé ag béiceach “cá bhfuil tú a frog”.

He started shouting “where are you frog”

2 Propositions [2 events] [verbal noun complement clause + direct speech].

“Shhh” a dúirt sé.

“Shhh” (that) he said.

2 Propositions because shhh is a verb [2 events] [direct speech , relative clause].

Bhí sé ag rá “shhh”.

He was saying “shhh”.

2 Propositions because shhh is a verb [2 events] [direct speech].

“Caithfidh mé dhul ag cuartú an frog seo”.

“I have to go searching for this frog”

1 Proposition [1 event] [verbal noun complement clause].

“Bhí mé ag dhul ag cuartú an frog”.

“I was going searching for this frog”

1 Proposition [1 event] [verbal noun complement clause].

Nuair a bhí siad beag, bhí siad sásta.

When they were small, they were happy.

2 Propositions [2 events] [relative clause; adverbial clause].

Bhí sé ag dhul síos le hello a rá le frog.

He was going down (in order) to say hello to frog

2 Propositions [2 events] [adverbial clause].

B’fhéidir gur fhoghlaim sé rud éigin.

Maybe (that) he learned something.

2 Propositions [2 events] [propositional complement clause].

Multi-clause Syntax frequency measures

Use of English and Multi-clause Syntax frequency.

Sometimes children produced conjunctions in English in adverbial and coordinate sentences. These mixed language constructions were counted in Multi-clause Syntax frequency measures.

In Table 40, below, the different types of Multi-clause Syntax included in frequency counts are listed and explained. Examples are provided to improve the clarity of explanations.

Appendices

Table 40: Types of Multi-clause Syntax: Labels, definitions and examples.

	Definition	Example
Coordinate clause	A coordinate clause is a clause belonging to a series of two or more clauses which are not syntactically dependent on each other and which are joined by means of a coordinating conjunction i.e. <i>agus</i> / 'and', <i>ach</i> / 'but', <i>nó</i> / 'or'. Conjunctions may be in Irish or in English.	- <i>bhí siad a chodladh agus bhí a(n) frog imithe amach as a(n) fuinneog</i> : 'they were sleep and the frog was gone out the window. ' - <i>bhí an mada a(g) tafann and bhí an buachaill a(g) breathnú isteach sa crann</i> : 'the dog was barking and the boy was looking into the tree.
Positive direct relative clause	A direct relative construction is where the subject or object is represented by a noun phrase in another clause. This other clause is the direct relative clause and functions as an attribute. A direct relative clause is also used following all fronting. The direct relative clause, in its positive form, is introduced by the direct relative particle <i>a</i> which lenites in most contexts.	- <i>cén sórt torann a bhí ann</i> : 'what sort of a noise was there. ' - <i>ní frag (a) bhí istigh ann</i> : 'it wasn't a frog that was inside in it. ' - <i>céard atá ann?</i> 'what (lit. that) is there?'
Positive indirect relative clause	The most frequent form of indirect relatives in children's stories was the simple question construction <i>cá bhfuil</i> ('where are'). Other than those, indirect relatives were mostly of the extension type. In the extension type of indirect relative the verb of the embedded sentence is connected by a noun functioning as an adverbial or adjectival extension (as in the first example). The resumptive pronoun type was only attempted on one occasion and only by one child. A resumptive pronoun type indirect relative is shown in the second example. Here the head noun of the relative is linked with the pronoun in the prepositional pronoun <i>faoi</i> 'under it'. The indirect relative clause, in its positive, present tense form, is introduced by the indirect relative particle <i>a</i> or <i>go</i> , followed by eclipsis, and where available by the dependent verbal form.	- extension type: <i>bhí siad a(g) cuimhniú cé(n) chaoi a ngabhfadh siad abhaile le mam agus daidí</i> : 'they were thinking how (lit. what way that) they would go home with mom and dad. ' - resumptive pronoun type: <i>tá mé breathnú isteach faoin crann,, an ceann *tá (correct: a bhfuil) uisce faoi</i> : 'I'm looking in under the tree,, the one that has water under it. '
Adverbial clause	An adverbial clause is a dependent clause which modifies a verb or a whole clause. It indicates time, place, condition, contrast, concession, reason, purpose or result. It is linked to a main clause by a subordinating conjunction e.g. just in case, because, until, as long as, when, after, if, before.	- <i>nuair a chonaic siad a(n) frag a bheith imithe, bhí siad oibrithe leo féin</i> : ' when they saw that the frog was gone they were annoyed with themselves.' - <i>bhí siad brónach mar imigh an frogain beag</i> : 'they were sad because the little frog left. ' - <i>bhí an crúsca chomh trom gur thit an mada amach an fuinneog</i> : 'the jar was so heavy that the dog fell out the window. ' - <i>bhí siad an-crosta so bhí siad fós leanacht é</i> : 'they were very angry so they were still following him. '
Propositional/ adjectival complement clause	A propositional complement modifies perception (seeing, smelling, hearing etc.), cognition (knowing, remembering, hoping, feeling etc.) or utterance (indirect only e.g. 'he said (that) he was going ...') verbs. An adjectival complement modifies adjectives. These clauses, in their positive forms, are linked to the main clause by the preverbal particle <i>go</i> . Conjunctions may be in Irish or English.	- <i>dúirt na fragannaí go gabha siad ar cuairt chuig an frag</i> : 'the frogs said that they would go visit the frog.' - <i>b'fhéidir go bhfuil frag istigh ann</i> : 'maybe frog is in there.' - <i>bhí siad happy go raibh an frag ann</i> : 'they were happy that the frog was there.'

Appendices

Table 40 continued: Types of Multi-clause Syntax: Labels, definitions and examples

	Definition	Example	
Simple verbal noun complement clause	A verbal noun complement is a complement clause in which the subject is absent as it is identical to some noun phrase in the matrix clause. In the case of a simple verbal noun complement, the verbal noun is an intransitive verb and typical Verb-Object word order is observed in the complement.	- bhí sé ag iarraidh dhul abhaile: 'he wanted to go home. ' - ní(l) cead a(ga)t breathnú isteach sa gcrúsca: 'you're not allowed to look into the jar. '	
Complex verbal noun complement clause	A verbal noun complement is a complement clause in which the subject is absent as it is identical to some noun phrase in the matrix clause. In the case of a complex verbal noun complement, the verbal noun is a transitive verb and Verb-Object word order is not observed in the complement. The direct object of a verbal noun complement precedes the verbal noun.	- ní raibh sé in ann é a fháil amach: - bhí an madra triall na beacha lickeáil: bees.	'he wasn't able to get it out. ' 'the dog was trying to lick the
Direct speech	Direct speech occurs when a direct quote is given whether following a speech or thought verb (e.g. shout or wonder) or even a more general way of expressing these verbs e.g. 'he went "frog, where are you?"'	- ansin bhéic an buachaill é seo "tabharfaidh mé go leor aire dhó" 'then the boy shouted this "I will give him a lot of care." - "shhh shhh" a deir an fear leis an mada. "shhh shhh" says the man to the dog.' - bhí siad ag cuimhniú "céard a dhéanfaidh muid anois" they were thinking "what will we do now."	
Pseudo-cleft construction	In a cleft construction, the part of the sentence to be emphasised is split from the sentence 'cleft' and appears as the predicate of the copula in a copular clause. The rest of the sentence follows then as a relative clause. In the case of a pseudo-cleft construction, the part being emphasised appears at the end of the sentence, but is represented at the beginning of the sentence with a pronoun (often an interrogative pronoun). A relative clause follows this pronoun.	céard a bhí ann ach na frag: 'what was there but the frogs.'	

Note: For the sake of clarity, grammatical errors are marked with an asterisk. Grammatical accuracy did not affect frequency counts which were generally based on attempts. There is one exception to this general rule: relative clauses. When an indirect relative clause was incorrect it was often produced as a direct relative clause instead. These cases were counted as direct relative clauses in frequency counts.

Appendices

Included in the measure Diversity of Complex Syntax were the following eight types of complex syntax. Coordinate syntax is not included in this measure. Differentiation is made between coordinate and complex syntax because, across languages, coordinate syntax has long been accepted as an earlier developing type of Multi-clause Syntax (Irish: Hickey, 1988; English: Clancy et al., 1976; Paul, 1981; Miller, 1981, Japanese: Okubo, 1967; Fujiwara, 1977, Clancy, 1985, German, Italian, Turkish: Clancy et al., 1976).

- Verbal noun complement clause (simple and complex verbal noun complement clauses are considered a single type of complex syntax when calculating Diversity of Complex Syntax)
- Positive direct relative clause
- Positive question direct relative clause
- Indirect relative clause
- Adverbial clause
- Propositional complement
- Direct speech
- Pseudo cleft construction

Counts of instances of complex syntax included the above measures with one exception. At times, the direct speech and direct relative clause categories overlapped e.g. “*frog*” *a dúirt sé*. Such constructions were considered one instance of complex syntax rather than two.

Grammatical Accuracy measures

Use of English and Grammatical Accuracy.

Sometimes children produced conjunctions in English in adverbial and coordinate sentences. These multi-clause sentences were considered grammatically accurate if they were similar to what was generally produced by adults in the community i.e. what was in the children’s input.

e.g. *léim sé isteach buachaill lámh **and** chuaigh sé abhaile leis.*

e.g. *d’imigh sé **because** nach raibh sé ann.*

Appendices

Consult Ó Curnáin (2007, p. 1915) for further examples of English conjunctions (e.g. because, but, so, even) used in Irish sentences.

Subcategories and variations of those measures on which parents were inconsistent.

In Table 20 presented in the Methodology chapter, reference is made to four categories of grammatical structures in which parents were inconsistent. For two of these grammatical structures, multiple subcategories and variations were analysed with the aim of providing a better understanding of parents' and children's performance with these grammatical structures. These subcategories are listed and explained in Table 41. Explanations are, again, clarified with examples.

Appendices

Table 41. Explanations and examples for subcategories and variations of grammatical accuracy measures for which parents were inconsistent.				
Grammatical accuracy measures for which parents were inconsistent	Explanation	Summary of Explanation		
Prepositional case inflection of nouns (17 subcategories and variations)	The proportion of obligatory contexts in which nouns are inflected for prepositional case.	Including the noun <i>frog</i> ?	Accepting all initial mutations marking prepositional case in feminine nouns following articles?	Including the preposition and article combinations <i>sa</i> and <i>dhon</i> ?
1. Total prepositional case inflection of nouns directly following a preposition.	The proportion of obligatory contexts in which nouns are inflected for prepositional case directly following a preposition. Examples: <i>ar chrann</i> : on a tree; <i>i gcrúsca</i> : in a jar; <i>*i poll</i> : in a hole.	Y	n/a	n/a

Appendices

2. Prepositional case inflection of borrowed nouns directly following a preposition.	The proportion of obligatory contexts in which borrowed nouns are inflected for prepositional case directly following a preposition. Example: * <i>i puddle</i> : in a puddle.	Y	n/a	n/a
3. Prepositional case inflection of nouns (excluding <i>frog</i>) directly following a preposition.	The proportion of obligatory contexts in which nouns (excluding <i>frog</i>) are inflected for prepositional case directly after a preposition.	N	n/a	n/a
4. Lenition marking prepositional case inflection of nouns directly following a preposition.	The proportion of obligatory contexts in which nouns are marked by lenition for prepositional case directly following a preposition. Examples: * <i>ar crann</i> : on a tree ; <i>ar chnoc</i> : on a hill ; <i>ar chloigeann an buachaill</i> : on the boy's head.	Y	n/a	n/a
5. Eclipsis marking prepositional case of noun following the preposition <i>i</i> = in.	The proportion of obligatory contexts in which nouns are marked for prepositional case by eclipsis directly following the preposition <i>i</i> . Examples: <i>i gcrann</i> : in a	y	n/a	n/a

Appendices

	tree; * <i>i crúsca</i> : in a jar.			
6. Total prepositional case inflection of nouns following the article.	The proportion of obligatory contexts in which nouns are inflected for prepositional case following the article. This measure includes the noun <i>frog</i> and the preposition and article combinations <i>sa</i> and <i>dhon</i> and accepts the prepositional case marking with lenition of feminine nouns beginning with <i>f</i> and <i>s</i> . Examples: <i>ar an gcrann</i> : on the tree; * <i>ag an frog</i> : at the frog; <i>as an fhuinneog</i> : out of the window; <i>dhon chloch</i> : of/to the stone.	Y	y	Y
7. Prepositional case inflection of borrowings following the article .	The proportion of obligatory contexts in which borrowed nouns are inflected for prepositional case following the article. This measure includes the noun <i>frog</i> . Examples: * <i>ar an frog</i> : on the frog ; * <i>ar an blac</i> : on the block.	Y	n/a	Y

Appendices

<p>8. Prepositional case inflection of the noun <i>frog</i> following the article.</p>	<p>The proportion of obligatory contexts in which the noun <i>frog</i> is inflected for prepositional case following the article. Examples: *<i>ar an frog</i> : on the frog; <i>leis an bhfrog</i> : with the frog.</p>	y	n	Y
<p>9. Prepositional case inflection of nouns following the article (Type A).</p>	<p>The proportion of obligatory contexts in which nouns are inflected for prepositional case following the article. This measure excludes the preposition and article combinations <i>sa</i> and <i>dhon</i>, includes the noun <i>frog</i> and accepts the prepositional case marking with lenition of feminine nouns beginning with <i>f</i> and <i>s</i>. Examples: <i>ar an gcrann</i> : on the tree; *<i>ag an frog</i> : at the frog; <i>as an fhuinneog</i> : out of the window.</p>	y	y	N

Appendices

<p>10. Prepositional case inflection of nouns following the article (Type B)</p>	<p>The proportion of obligatory contexts in which nouns are inflected for prepositional case following the article. This measure excludes the noun <i>frog</i> and the preposition article combinations <i>sa</i> and <i>dhon</i>. It accepts the prepositional case marking with lenition of feminine nouns beginning with <i>f</i> and <i>s</i>. Examples: <i>ar an gcrann</i> : on the tree; <i>as an fhuinneog</i> : out of the window.</p>	<p>n</p>	<p>y</p>	<p>N</p>
<p>11. Prepositional case inflection of nouns following the article (Type C)</p>	<p>The proportion of obligatory contexts in which nouns are inflected for prepositional case following the article. This measure excludes the noun <i>frog</i> and the preposition and article combinations <i>sa</i> and <i>dhon</i> and does not accept the prepositional case marking with lenition of feminine nouns beginning with <i>f</i> or <i>s</i>. Examples: <i>ar an gcrann</i> : on the tree; *<i>as an fhuinneog</i> :</p>	<p>n</p>	<p>n</p>	<p>N</p>

Appendices

	out of the window.			
12. Prepositional case inflection of nouns following the article (Type D).	<p>The proportion of obligatory contexts in which nouns are inflected for prepositional case following the article. This measure excludes the noun <i>frog</i>, includes the preposition and article combinations <i>sa</i> and <i>dhon</i> and does not accept the prepositional case marking with lenition of feminine nouns beginning with <i>f</i> or <i>s</i>.</p> <p>Examples: <i>ar an gcrann</i> : on the tree; *<i>as an fhuinneog</i> : out of the window; *<i>ón bhfuinneog</i> : from the window; *<i>sa gcrann</i> : in the tree.</p>	n	n	Y

Appendices

<p>13. Prepositional case inflection of nouns following the article (Type E)</p>	<p>The proportion of obligatory contexts in which nouns are inflected for prepositional case following the article. This measure excludes the preposition and article combinations <i>sa</i> and <i>dhon</i>, includes the noun <i>frog</i> and does not accept the prepositional case marking with lenition of feminine nouns beginning with <i>f</i> and <i>s</i>. Examples: <i>ar an gcrann</i> = on the tree; *<i>ag an frog</i> = at the frog; *<i>as an fhuinneog</i> = out of the window.</p>	<p>y</p>	<p>n</p>	<p>n</p>
<p>14. Prepositional case inflection (eclipsis or lenition) of feminine nouns beginning with <i>f</i> or <i>s</i> following the article.</p>	<p>The proportion of obligatory contexts in which nouns are inflected for prepositional case following the article. This measure excludes the preposition and article combinations <i>sa</i> and <i>dhon</i>. Examples: <i>as an fhuinneog</i> : out of the window; <i>as an bhfuinneog</i> : out of the window.</p>	<p>n</p>	<p>y</p>	<p>n</p>

Appendices

15. <i>sa</i> + eclipsis	The proportion of obligatory contexts in which nouns are inflected for prepositional case following the combined preposition and article <i>sa</i> . This measure excludes the noun <i>frog</i> . Examples: <i>sa gcrannn</i> : in the tree; <i>sa bpoll</i> : in the hole; * <i>sa poll</i> : in the hole; * <i>sa buidéal</i> : in the bottle.	n	n	just <i>sa</i>
16. <i>dhon</i> + lenition	The proportion of obligatory contexts in which nouns are inflected for prepositional case following the combined preposition and article <i>dhon</i> . This measure excludes the noun <i>frog</i> . Examples: <i>dhon chrann</i> : of/to the tree; * <i>dhon cloch</i> : of/ to the stone.	n	n	just <i>dhon</i>
17. Total prepositional case inflection of borrowings	The proportion of obligatory contexts in which borrowed nouns are inflected for prepositional case. Examples: * <i>i puddle</i> : in a puddle; * <i>ar an blac</i> : on the block; * <i>ar an frog</i> : on the frog; <i>leis an bhfrog</i> : on the	y	n/a	y

Appendices

	frog.			
Genitive case inflection of nouns (6 subcategories)	The proportion of obligatory contexts in which nouns are inflected for genitive case.			
1. Total genitive case inflection of nouns	The proportion of obligatory contexts in which nouns are inflected for genitive case. Often nouns have an initial and final mutation to mark genitive case e.g. 'cloigeann an gh adhair' or the article also changes e.g. i lár na coille. Both must be present to be counted as a correct example of this measure. Examples: <i>i lár na coille</i> : in the middle of the forest; <i>*ag leanacht an madra</i> : following the dog; <i>*ar an chloigeann an gadhar</i> : on the head of the dog.	y	n/a	n/a

Appendices

2. Genitive case inflection of borrowings from English.	The proportion of obligatory contexts in which borrowed nouns are inflected for genitive case. This measure includes the noun <i>frog</i> . Examples: * <i>ag ithe seacláid</i> : eating chocolate.	y	n/a	n/a
3. Genitive case inflection of native Irish words	The proportion of obligatory contexts in which native Irish nouns are inflected for genitive case. Examples: <i>ag leanacht an bhuachaillín</i> : following the boy; <i>píosa adhmaid</i> : a piece of wood; <i>ag fáil nóiméad suaimhnis</i> : getting a moment's peace.	n	n/a	n/a
4. Genitive case inflection of the word <i>frog</i>	The proportion of obligatory contexts in which the noun <i>frog</i> is inflected for genitive case. Examples: * <i>ag quartú an frog</i> : looking for the frog; * <i>páistí de frog</i> : the frog's children.	y	n/a	n/a

Appendices

<p>5. Genitive case inflection of words excluding <i>frog</i>.</p>	<p>The proportion of obligatory contexts in which nouns (excluding <i>frog</i>) are inflected for genitive case. Examples: *<i>ag leanacht an madra</i> : following the dog; <i>ar bharr na carraige</i> : on top of the rock.</p>	<p>n</p>	<p>n/a</p>	<p>n/a</p>
<p>6. Initial mutation marking genitive case inflection in nouns excluding <i>frog</i>.</p>	<p>The proportion of obligatory contexts in which initial mutation marks genitive case inflection in nouns excluding <i>frog</i>. Example: <i>i lár na hóiche</i> : in the middle of the night ; *<i>teach na beachainní</i> : the bees' house *<i>ag leanacht an madra</i> : following the dog; <i> lámh an bhuachail</i> : the boy's hand.</p>	<p>n</p>	<p>n/a</p>	<p>n/a</p>

Appendices

Appendix 7: A comparison of Proportion Irish Input: Since Birth and Current.

Table 42:
Proportion Irish input: since birth, current and the direction and quantity of change over time.

Participants	Proportion Irish Input Since Birth	Proportion Current Irish Input	Direction of Change	Quantity of Change
C1	0.923	0.543	Decrease	0.380
C2	0.933	0.905	Decrease	0.028
C3	0.833	0.876	Increase	0.043
C4	0.191	0.670	Increase	0.479
C5	1.000	0.949	Decrease	0.051
C6	0.994	0.938	Decrease	0.057
C7	0.602	0.892	Increase	0.290
C8	0.690	0.971	Increase	0.281
C9	0.851	0.867	Increase	0.016
C10	0.971	0.757	Decrease	0.104
C11	0.994	0.915	Decrease	0.078
C12	0.815	0.497	Decrease	0.318
C13	0.990	0.963	Decrease	0.026
C14	1.000	1.000	None	0
C15	0.415	0.666	Increase	0.251
C16	0.917	0.994	Increase	0.077
C17	0.983	1.000	Increase	0.017
C18	0.886	0.792	Decrease	0.094
C19	0.906	0.951	Increase	0.045
C20	0.611	0.718	Increase	0.107
C21	0.949	0.869	Decrease	0.080
C22	0.995	0.957	Decrease	0.037
C23	0.794	0.797	Increase	0.003
C24	1.000	1.000	None	0
C25	0.996	0.989	Decrease	0.007
C26	1.000	1.000	None	0
C27	0.996	0.872	Decrease	0.124
C28	0.935	0.772	Decrease	0.163
C29	0.995	0.920	Decrease	0.075
C30	0.960	0.903	Decrease	0.075
C31	0.558	0.676	Increase	0.118
C32	0.934	0.919	Decrease	0.015
C33	0.949	0.912	Decrease	0.037
C34	0.868	0.737	Decrease	0.131
C35	0.046	0.467	Increase	0.421
C36	0.935	0.882	Decrease	0.053
C37	0.832	0.981	Increase	0.149
C38	0.992	0.971	Decrease	0.020
C39	1.000	1.000	None	0

Appendices

Appendix 8

Table 43. Acquisition of Grammatical Accuracy measures

Grammatical Accuracy Measure	Proportion Irish Input	3 year olds		4 year olds		5 and 6 year olds	
		Proportion who have obligatory contexts	Proportion of these who have acquired the form	Proportion who have obligatory contexts	Proportion of these who have acquired the form	Proportion who have obligatory contexts	Proportion of these who have acquired the form
Past Tense Lenition	High	1	.9	1	.92	1	1
	Low*	1	0	1	1	1	.5
Past Tense Proclitic d'	High	.7	.71	.67	.88	1	.9
	Low*	.67	0	.5	1	.5	0
Past Tense Lenition of <i>bí</i>	High	1	1	1	1	1	1
	Low*	1	.33	1	1	1	.5
Lenition of Verbal Nouns / Direct Relative Verbs following Complementiser <i>a</i>	High	.3	.33	.17	1	.7	1
	Low*	0	0	.5	1	.5	1
Eclipsis of Verbs following the Complementiser <i>go</i>	High	.2	1	.1	0	.3	0
	Low*	0	0	.5	0	0	0

Appendices

Future Tense of Verbs	High	1	.6	.5	.83	.7	.86
	Low*	.67	.67	.5	1	.5	1
Dependent Form of <i>bí:</i> <i>raibh/bhfuil</i> following particles	High	1	1	1	.91	.9	.89
	Low*	.67	0	1	1	1	1
Irregular Verbs following Negative Particles	High	.9	1	1	.92	.9	.78
	Low*	.67	0	1	1	1	1
Masculine Possessive Pronoun Lenition of Nouns	High	.9	.44	.83	.5	1	.80
	Low*	.67	.33	.5	0	1	.5
Plural Nouns	High	1	.4	1	.58	1	.6
	Low*	1	.33	1	0	1	0
Inappropriate Lenition of Nouns**	High	1	.5	1	.75	1	.6
	Low*	1	.67	1	.5	1	.5
Inappropriate Eclipsis of Nouns**	High	1	1	1	1	1	.9
	Low*	1	1	1	1	1	1
Simple Prepositions	High	1	.7	1	.92	1	.7
	Low*	1	1	1	1	1	0
<i>San</i> Preceding Nouns beginning with Vowels	High	.4	1	.58	.86	.4	1
	Low*	.67	.5	1	1	0	0
<i>San</i> preceding Nouns	High	.9	1	.75	.78	.9	.78

Appendices

beginning with Consonants***	Low*	.67	.33	1	.5	1	1
Simple Verbal Noun Complement Clauses	High	.5	.6	.58	.86	.8	1
	Low*	.67	.33	1	1	.5	0
Special Word Order in Complex Verbal Noun Complement Clauses	High	.5	0	.5	.67	.9	.67
	Low*	.67	0	.5	0	1	0
Direct Relative Clauses	High	.8	1	.82	.7	.9	1
	Low*	.67	1	1	1	.5	1
Propositional and Adjectival Complement Clauses	High	.1	0	.58	.29	1	.3
	Low*	.33	0	1	.5	1	0
Adverbial Clauses	High	.6	.83	.67	.75	.9	.44
	Low*	.67	1	1	1	.5	1
Direct Speech Constructions	High	.9	1	.83	1	.8	1
	Low*	1	1	1	1	1	1
Pseudo-Cleft Constructions	High	.2	.5	.5	.5	.3	.67
	Low*	.33	0	.5	0	0	0
Preverbal Particles	High	1	.9	1	.83	1	1
	Low*	1	1	1	1	1	1
Adjective Agreement with Plural Nouns	High	.6	.67	.42	1	.9	.67
	Low*	.67	.5	0	0	1	.5

Appendices

ag Preceding Verbal Nouns	High	1	.5	1	.42	1	.4
	Low*	1	.33	1	.5	1	.5
Article Agreement with Plural Nominative Case Nouns	High	.9	.78	.92	.64	1	.7
	Low*	.67	.5	1	.5	1	0

Notes: In this table, 85%+ accuracy is used as the acquisition criterion unless otherwise noted below. Shading indicates that in the relevant age group, 85%+ children show acquisition of the grammatical accuracy measure. * It should be noted that, in this study, accuracy information with regard to low input children is a lot less informative than accuracy information with regard to high input children because there are only 2 or 3 low input children per age group (3 low input 3 year olds; 2 low input 4 year olds and 2 low input 5 and 6 year olds). ** This measure is not calculated as a proportion. So rather than 85% accuracy used as acquisition criterion, if 0 or only 1 instance of inappropriate lenition/eclipsis then child is considered to have acquired appropriate lenition/eclipsis. *** Acquisition on this measure means that *san* is not used before nouns beginning with consonants as is the case in the adult language.

Appendix 9

Table 44. Verb Vocabulary Types included in the children’s narratives and how many children produced them at each age group: a selection.

Example of verb vocabulary type	English translation of example of verb type	Number of 3 year olds who used this verb type at least once	Number of 4 year olds who used this verb type at least once	Number of 5 and 6 year olds who used this verb type at least once
Fuair	got	1	2	8
d’ith	ate	1	3	1
Tá	is	7	7	4
Gléasadh	getting dressed	0	1	0
Chuaigh	went	5	10	10
d’imigh	left	8	7	6
Léim	jumped	10	12	10
Dúirt	said	9	9	9
Laughed	-			
bhreathnaigh	looked	12	12	10
Thit	fell	12	14	12
Are	-			
bhris	broke	10	12	8
Bhí	was	13	14	12
Raibh	was	8	12	10
Rith	ran	10	9	11
Stop	stopped	5	5	9
Bhiteáil	bit	0	2	2
ag goil	going	7	12	6
Tháinig	came	3	7	6
hit	-	0	1	0
Play	-	0	1	0
don't	-	0	1	0
Rinne	made / did	0	4	1
Chonaic	saw	2	7	5
Chuir	put	2	3	3
Wakeáil	woke	0	1	0
Deir	say	0	4	0
Phickeáil	picked	0	1	0
Sheas	stood	1	1	0
Stuck	-	6	4	5
Scratcháil	scratched	0	1	0
Climbeáil	climbing	1	1	1
Leanach	following	3	3	5
flyáil	flying	0	1	1
Checkáil	checked	0	1	1
Fheiceáil	seeing	3	2	2
Bhéic	shouted	3	0	0

Appendices

Bhfuil	is	7	8	8
Triáil	tried	1	3	5
Spraoi	play /fun	1	0	1
Is	is	2	1	5
Phlaic	bite	1	2	2
Leag	knocked	4	5	3
Chroch	hung	2	1	0
Coinneáil	kept	2	0	2
d'éirigh	got up /rose	4	2	2
Bhain	took off (clothing)	5	5	2
Scrios	destroy	1	0	0
Bheir	grab/hold	2	3	6
d'iompair	carried	1	0	0
Chuala	heard	1	5	5
Tabharfaidh	will give	1	1	3
Dhúisigh	woke	0	6	7
Ghlaoigh	called	4	3	6
Cuartú	searching	3	4	5
Lickeáil	licking	0	1	1
Ghortaigh	hurt	0	3	1
Bhrúigh	pushed	0	2	2
Fáil	getting	3	1	4
Rá	say	3	3	3
Tógfaimid	we will take	1	1	5
Tíocht	coming	0	1	3
Ba	was	0	0	1
Aireachtáil	feel/hear	1	2	3
Stepáil	stepped	0	0	1
Bheith	be	0	2	2
Thosaigh	started	0	0	2
Ní	is not	1	4	3