Research Repository UCD

Title	Acquiring an opaque gender system in Irish, an endangered indigenous language
Authors(s)	Nic Fhlannchadha, Siobhán, Hickey, Tina
Publication date	2017-04-20
Publication information	Nic Fhlannchadha, Siobhán, and Tina Hickey. "Acquiring an Opaque Gender System in Irish, an Endangered Indigenous Language" 37, no. 5 (April 20, 2017).
Publisher	Sage
Item record/more information	http://hdl.handle.net/10197/9929
Publisher's statement	Nic Fhlannchadha, S., Hickey, T.M. Acquiring an opaque gender system in Irish, an endangered indigenous language, First Language (37(5)) pp. 475-499. Copyright © 2017 Sage. Reprinted by permission of SAGE Publications.
Publisher's version (DOI)	10.1177/0142723717702942

Downloaded 2023-04-07T10:52:29Z

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd_oa)

© Some rights reserved. For more information

Nic Fhlannchadha, S. and Hickey, T.M. (2017) Acquiring an opaque gender system in Irish, an endangered indigenous language *First Language*, 37, 5, 475-499.

Acquiring an opaque gender system in Irish, an endangered indigenous language¹

Siobhán Nic Fhlannchadha & Tina M. Hickey²

School of Psychology, University College Dublin, Ireland

Abstract

An in-depth examination of the acquisition of grammatical gender has not previously been conducted for Irish, an endangered indigenous language now typically acquired simultaneously with English, or as L2. Children acquiring Irish must contend with the opacity of the Irish gender system and the plurifunctionality of the inflections used to mark it, while also experiencing early exposure to the majority language and variability in amount and consistency of adult input in Irish. Data were collected from 306 participants aged 6–13 years, including information on home language background which allowed children to be categorised as being from homes which were Irish-dominant, bilingual, or English-dominant. Novel measures of receptive and productive use of grammatical gender were developed to test children's understanding and production of gender marking. A standard multiple regression conducted which accounted for 39.5% of the variance showed that language background was the strongest predictor of accuracy in marking grammatical gender assignment and agreement. The later stages of acquisition of semantic and grammatical gender have not previously been investigated in Irish, and the implications for researchers, policy makers, educators and parents are discussed.

Introduction

The middle stages of language development show slower and more subtle change than the early stages. Later acquisition remains relatively under-researched compared to the significant body of work exploring the early stages of monolingual and multilingual language

¹ Siobhán Nic Fhlannchadha, School of Psychology, Newman Building, UCD, Belfield, Dublin 4, Ireland. Email: Siobhan.nic-fhlannchadha@ucdconnect.ie

² The authors wish to thank the children, parents, teachers and principals who participated in the study. The authors also wish to acknowledge the valuable comments from the anonymous reviewers.

acquisition (Berman, 2007; Unsworth, 2013a), and this is even more the case in relation to later language acquisition among simultaneous bilinguals, particularly where a lesser-used or minority language is involved.

Aspects of morphosyntax present particular challenges in some languages, with studies by Rodina and Westergaard (2013), Boloh and Ibernnon (2013) and Blom, Polisenska, and Weerman (2008) demonstrating a protracted trajectory of acquisition of grammatical gender in Norwegian, French and Dutch respectively. Rodina and Westergaard (2013) showed evidence of considerable delay in the acquisition of gender agreement in Norwegian, a language with an opaque grammatical gender system. Here, we examine the acquisition of grammatical gender in Irish, a Celtic language with an opaque gender system which is experiencing contraction in the number of its native speakers. In order to set the scene for this study of an aspect of Irish grammar that shows protracted acquisition, it is necessary to consider first a number of factors relating to bilingual acquisition of an endangered language, such as input and sociolinguistic context. Following this, the Irish gender marking system is briefly outlined before data are presented from a large sample of children aged 6 to 13 years.

The centrality of the input

Extensive cross-linguistic research has shown that successful bilingual acquisition is highly dependent on language input and experience (De Houwer, 2007; Gathercole & Thomas, 2009; Paradis, Tremblay, & Crago, 2014; Thomas & Gathercole, 2007; Thordardottir, 2014, 2011). Thordardottir (2011) found that bilinguals with similar levels of exposure to French and English had similar levels of performance in both those languages, whereas children with unequal patterns of exposure performed considerably more strongly in the language to which they had more exposure. Thordardottir (2014) later found that those with equal amounts of exposure to English and French, by the age of 5, could productively use several tenses other than the present, while children with unequal exposure did not use regular or irregular English past tense accurately. Thus, there is evidence that the formal complexity of specific within-language features influences the rate of acquisition, while Thordardottir's findings demonstrate that this can interact with language experience to affect rate of acquisition.

In her seminal study of acquisition of gender, Karmiloff-Smith (1979) noted that semantic cues are useful for gender attribution in animate nouns, but insufficient for inanimate nouns, which require additional information, and for which prediction of grammatical gender may be difficult in many languages. Belacchi and Cubelli (2012) discussed the role played by semantic regularities in assigning grammatical gender, and

Desrochers and Brabant (1995) found that children responded faster to nouns referring to humans than inanimate objects. Belacchi and Cubelli found that animal terms were more easily acquired by children, partly because of their animacy and frequency of use by children, and were indicative of implicit linguistic knowledge.

Karmiloff-Smith noted that children are likely to take longer, and to need more input before they gain productive control of more formally complex grammatical gender systems. Thomas and Gathercole (2007) observed that acquisition of an opaque grammatical gender system such as Welsh is a protracted process which is affected by the formal complexity involved and the typical usage norms of proficient adults who provided input to the children. They argued that the results they found among Welsh–English bilingual children aged 7–11 showed that their grammatical gender marking was indicative of item-based learning and a piecemeal approach to a complex grammatical gender system, and that children did not adopt a rule-based approach in their use of this feature of Welsh. Unsworth (2013b) went on to differentiate between the strategies needed for gender attribution and gender agreement in Dutch. In line with the Welsh study, the results pointed to protracted acquisition of grammatical gender in Dutch, well beyond the age of 5, but were inconclusive in relation to the strategies used. Paradis et al. (2014) examined the form–function mapping of French direct object clitics among French–English bilinguals aged 6 and 11. French direct object clitics are believed to be relatively difficult to acquire due to the inconsistent plurifunctionality of ‘les’ as both a direct object clitic and plural definite article. The token frequency of ‘les’ is much higher for its use as a plural definite article than as a direct object. However, the authors argued that the functional importance of ‘les’ as a direct object in meaningful utterances compensates for its low frequency in input, and they found mastery of this feature by age 11 (which is, nevertheless, quite late).

The interaction of formal complexity and variable levels of input in the acquisition of grammatical gender marking by simultaneous bilinguals has been considered in a small number of studies. Gathercole and Thomas (2009), in their study of Welsh grammatical gender acquisition, categorised Welsh–English bilinguals according to their levels of exposure to each language, and they found that consistent lags in acquisition of this system between bilinguals and monolingual Welsh speakers could be attributed to the bilinguals’ lower exposure to Welsh on a daily basis. They concluded that children need a ‘critical mass’ of input in a language in order for them to be able to go beyond piecemeal, item-by-item learning to the formal, abstract understanding required for mastery of the later-acquired, more complex aspects of the language. In this framework, given the need to reach a critical mass of

input, children who receive higher levels of input in a language are expected to show earlier progress to mastery, but by middle or late childhood it is expected that, in normal circumstances with school support, even children with lower levels of input at home are likely to have been exposed to sufficient input to give them control of the gender marking system (Gathercole, 2007).

The issue of a system requiring a particular level of input before it is acquired productively is relevant where input is reduced or limited, as is the case for bilingual children. Montrul and Potowski (2007) examined the acquisition of gender in Spanish by L1 speakers aged 6–11 in Mexico and heritage language Spanish–English bilinguals and L2 learners of the same age in a bilingual Hispanic community in Chicago, where Spanish is under pressure from the majority language English. Given Thomas and Gathercole’s proposal that the trajectory of acquisition of a particular system is extended in proportion to the complexity of that system, acquisition of the relatively transparent Spanish gender system (Alarcón, 2011) by L1 speakers would not be expected to require an extended acquisition period. The results from Montrul and Potowski showed performance very close to ceiling for grammatical gender in the narrative task by the L1 children and the heritage speakers (bilingual participants), while the L2 learners showed some errors. Further testing using a picture naming puzzle task showed more significant differences between the language background groups, whereby the L1 speakers were more accurate than the heritage speakers, who in turn were more accurate than the L2 learners of Spanish. However, in this puzzle task, the heritage simultaneous bilinguals showed only 40% accuracy in adjective agreement on feminine nouns, leading the authors to conclude that the Spanish gender system is not being fully acquired by heritage speakers. Thus, even in the context of a language with a transparent grammatical gender system, differences in language background experience impacted significantly on successful acquisition, with implications for heritage language simultaneous bilinguals. Similarly, Gathercole (2002) assessed bilingual Spanish–English and monolingual Spanish-speaking children’s receptive knowledge of noun gender in more idiosyncratic contexts and observed an increase in accuracy across the age range, which she argued pointed to protracted acquisition even where gender is less formally complex. Additional research which attempts to take into account the complexity of the gender system being acquired and variable levels of input received by those acquiring it would help to throw further light on this issue.

The Irish language: Acquiring a minority language in a bilingual context

Paradis (2011) and Grosjean (2010) observed that children's sensitivity to input factors is greater for minority languages than for majority languages. Gathercole (2014) and Gathercole and Thomas (2009) demonstrated that, for simultaneous bilinguals, acquisition of the majority language shows a greater likelihood of being unproblematic, whereas they observed that acquisition of a minority language is more vulnerable in needing sufficient frequent and consistent input in a context where the sources of that input are more limited than those for the majority language, in terms of numbers of speakers and domains of use.

In the Republic of Ireland, English is the dominant language and is used for most official and non-official interactions, despite constitutional protection for Irish and prominence in the education system, given the requirement that all children learn Irish from school entry. For the majority of children, this entails learning Irish as an L2 as a single subject, with only a minority of about 5% of schools offering Irish-medium immersion schools. Native Irish speakers are most numerous in regions known as *Gaeltacht* areas, which are officially designated Irish-speaking communities, located mainly in geographically isolated rural areas on the western, southern and northern seaboard. Census 2011 data show that 77,185 people reported speaking Irish daily outside the education system (interpreted as evidence that it is the language of their home). Of this number, Irish speakers in *Gaeltacht* areas constitute 23.3%, pointing to quite significant dispersal of Irish speakers throughout the state. Nevertheless, *Gaeltacht* Irish speakers are more likely to be clustered in communities of use, and to include significant numbers of families with children. Of the total population of *Gaeltacht*-dwelling Irish speakers in the Census 2011, 46.7% live in the Connemara *Gaeltacht* (in the west of Ireland) where the data for this study were collected.

Within *Gaeltacht* areas, children attend local *Gaeltacht* schools, which historically were, in most cases, Irish-medium schools. However, changes in the home-generated transmission of Irish in recent decades have resulted in increasing numbers of L2 learners attending these schools, leading to dilution of Irish-medium instruction: a recent report showed that Irish is now the language of instruction in only about 76% of *Gaeltacht* schools (Department of Education and Skills, 2016). Pupils attending these schools include children from homes where Irish is dominant, homes where both languages are used, and homes where English is dominant. Studies looking at language background in *Gaeltacht* preschools and schools (e.g. Hickey, 1999; Mac Donnacha, Ní Chualáin, Ní Shéaghdha, & Ní Mhainín, 2004) have noted that in many *Gaeltacht* classrooms, L1 speakers of Irish are in a minority and concern has been raised in recent years about deficiencies in the Irish of children

in *Gaeltacht* schools (e.g. Mac Donnacha et al., 2004; Péterváry, Ó Curnáin, Ó Giollagáin, & Sheahan, 2014; Lenoach, 2014).

Outside of the *Gaeltacht*, dissatisfaction since the 1970s with the outcomes of teaching Irish as a single subject in mainstream English-medium schools nationally contributed to increasing parent-led demand for the establishment of Irish-medium immersion schools (*Gaelscoileanna*). Irish-medium education in and outside the *Gaeltacht* has had some success in producing high proficiency not only in Irish, but also in English reading and in mathematics test scores (Gilleece, Shiel, Clerkin, & Millar, 2012). While the Irishimmersion schools aimed at L2 learners have shown strong growth and positive outcomes in terms of fluency in Irish, Ó Duibhir (2011), Ní Dhiorbháin (2014) and Ó Duibhir, Ní Dhiorbháin and Cosgrove (2016) have noted deficiencies in the Irish outcomes of immersion schools, and advocated a focus-on-form approach to improving grammatical accuracy. Taking this and the concerns about the standard of Irish among L1 *Gaeltacht* children, Ó Giollagáin (2014) warns that the current situation, with declining numbers of native speakers and increasing numbers of L2 learners, where the Irish of both groups shows increasing evidence of the influence of English, points to this endangered language now coming under unsustainable pressure.

Gender assignment in Irish

Not all languages encode grammatical gender consistently in their phonology or morphosyntax and research on typologically distinct languages is required to examine the impact of complex grammatical gender systems on language acquisition. Irish nouns have two genders (masculine and feminine), which are mostly semantically motivated based on their biological sex for animate nouns (Stenson, 1981), but for inanimate nouns, gender is determined according to features such as the type of ending and the quality of the final consonant (i.e. broad [velar] or slender [palatalised]). While there are some patterns or regularities in the gender system that stem from either phonological or morphological cues, there is also a great deal of ‘noise’ in this opaque system. Nouns are marked for gender using initial mutations, a set of morphophonological changes to the initial phoneme of words depending on the morphosyntactic context (Hickey, 2012; Stenson, 1981). Initial mutations marking gender are governed by definite articles and possessives (*inter alia*) and are applied in one of four ways: lenition, eclipsis, /t-/ prefixing and /h-/ prefixing. Lenition is an inflectional affix applied to the initial phoneme of a noun. In lenition, the initial phoneme is lenited (made more lenis in articulation) and in eclipsis, a voiced segment becomes nasalised and a voiceless segment becomes voiced. Lenition is marked orthographically by the insertion of a /h/ after the initial

stop, fricative or /m/, and eclipsis is marked by the prefixing of certain consonants to stops and /f/, or of /n/ to a vowel. Both lenition and eclipsis change the pronunciation of the original consonant, but there are many exceptions regarding which sounds they apply to (e.g. of the 13 consonants in Irish, only b, c, f, g, m and p can be lenited). Vowel-initial masculine nouns, and feminine nouns that are s-initial (s+vowel, sl, sn, sr) are marked for grammatical gender through the use of /t-/ prefixing. It is important to note that both lenition and eclipsis are plurifunctional markers used in a wide range of other morphosyntactic contexts.

Following the definite article

Irish has no indefinite article, but the definite article is marked for singular (*an*) and plural (*na*). Following the article '*an*', the unmarked masculine noun is the default and only the feminine noun is lenited:

<i>teach</i> (house; masc)	→ <i>an teach</i>	(Det N masc) 'the house'
<i>fuinneog</i> (window; fem)	→ <i>an fhuinneog</i>	(Det N fem <u>lenited</u>) 'the window'

In the case of s-initial nouns, the masculine remains the unmarked default, while feminine s-initial nouns are marked by prefixing /t-/:

<i>sionnach</i> (fox, masc)	→ <i>an sionnach</i>	(Det N masc) 'the fox'
<i>sráid</i> (street, fem)	→ <i>an tsráid</i>	(Det N fem /t-/ <u>prefixed</u>) 'the street'

However, for vowel-initial nouns, it is feminine nouns that are unmarked, while /t-/ prefixing is applied to masculine vowel-initial nouns:

<i>uisce</i> (water, masc)	→ <i>an t-uisce</i>	(Det N masc - /t-/ <u>prefixed</u>) 'the water'
<i>ubh</i> (egg, fem)	→ <i>an ubh</i>	(Det N fem) 'the egg'

Noun adjective agreement

Adjectives following masculine nouns are unmarked, but when a consonant-initial adjective follows a singular feminine noun in the nominative case, agreement is required, and the initial phoneme of such an adjective is subject to lenition:

<i>teach</i> (house, masc) + <i>bán</i> (white)	→ <i>an teach bán</i>	(Det N masc Adj) 'the white house'
<i>fiacail</i> (tooth, fem) + <i>bán</i> (white)	→ <i>an fhiacail bhán</i>	(Det N fem Adj- <u>lenited</u>) 'the white tooth'

Vowel-initial adjectives do not undergo any mutation in the nominative case.

Third person possession

Third person singular possession in Irish uses a gender-neutral possessive pronoun ‘a’ (<a X> ‘his X’ or ‘her X’), and the gender of the possessor noun is marked on the following possessed noun. Thus, after the third person possessive pronoun, masculine possession is signalled by leniting the consonant-initial possessed noun (regardless of the gender of the possessed noun), while feminine possession is signalled by leaving that noun unmarked. In the examples below, masculine singular possession (by *Seán*) is marked by lenition on the (consonant-initial) possessed nouns, but third person feminine singular possession (by *Síle*) does not lenite:

Seán (masc) + *cóta* (coat) → *a chóta* (masc possessive + N - lenited) ‘his coat’
Síle (fem) + *cóta* (coat) → *a cóta* (fem possessive + N) ‘her coat’

The exceptional case here is marking third person possession on vowel-initial nouns. This is achieved through /h-/ prefixing on vowel-initial nouns possessed by a feminine singular noun as antecedent, thereby reversing the pattern and making the masculine possession of such nouns the unmarked default:

anam (soul) + *Seán* (masc) → *a anam* (masc possessive + N) ‘his soul’
anam (soul) + *Síle* (fem) → *a h-anam* (fem possessive + N - /h-/ prefixed) ‘her soul’

Eclipsis is used to mark 3rd person plural possession (inter alia), where the possessive plural pronoun again is *a*, followed by eclipsis, as in the following:

Séan+Síle+cótaí (coats, pl) → *a gcótaí* (3rd plural poss + N + eclipsis) ‘their coats’

It is clear that grammatical gender marking in Irish is complex, with unmarked forms shifting between masculine and feminine depending on the initial phoneme of the noun and the morphosyntactic context. This opaque system is further complicated by the *plurifunctionality* of its markers, whereby a child hears the same word undergoing lenition and eclipsis in a variety of contexts, with variable form to function mapping.

Some studies such as Paradis et al (2014) have pointed to the role of factors such as frequency and salience/functional necessity in off-setting or mitigating the complexity of the system to be acquired. Looking to Irish, given the complexity of the grammatical gender marking and the plurifunctionality of lenition, not only in marking feminine gender following the definite article but also in a wide range of other contexts, as well as marking third person masculine possession, consistent gender marking in both of these contexts is likely to be delayed as children construct an accurate representation of this complex system. Marking

gender productively in the nominative case requires identifying the gender of the noun and then applying the appropriate mutation depending on the first phoneme of the noun. By contrast, third person possession marking requires identification of the gender of the possessor noun, often animate and therefore semantically more transparent, and masculine possession is consistently marked by lenition of the possessed noun (if it begins with a consonant). Given this difference in salience and communicative necessity, it is predicted that lenition to mark third person masculine possession will be acquired productively earlier than lenition to mark feminine gender assignment following the definite article or in noun-adjective combinations.

The present study

Irish has an opaque grammatical gender marking system, and currently this language is acquired alongside a high-status language, English, that does not mark grammatical gender. This combination is argued to make the acquisition of gender particularly vulnerable to convergence. It was decided to investigate the course of development in the acquisition of grammatical and semantic gender among children aged 6–13 acquiring Irish from a variety of home language backgrounds. Following on from this, the impact of age and home language exposure will be examined in order to assess their relative contribution to mastery of gender marking. Finally, the contribution of differences in function and complexity of parts of the gender system will be examined in order to consider which aspects of the system support or impede acquisition.

It was hypothesised that the relatively greater exposure to Irish experienced by children from *Gaeltacht* homes in which Irish is the dominant language and by older children who have spent more time in Irish-medium education would contribute to more advanced acquisition of the grammatical gender system, as evidenced by higher scores on the receptive and productive measures of grammatical gender marking. It was also predicted that, due to the communicative function of third person possession, children would show more accurate scores on tasks assessing this than on tasks requiring gender assignment following the definite article and in noun adjective agreement. Finally, it was hypothesised that gender marking for animate nouns would be acquired before gender marking for inanimate nouns due to the cue provided by congruence between semantic and grammatical gender.

Method

Participants

The sample comprised 306 participants, 145 males and 161 females with an age range of 6 to 13 ($M = 9.29$, $SD = 1.413$). Data about each child's home language background were collected using the Child Language Background Questionnaire (C-LBQ), a measure adapted to the Irish context from the Alberta Language Environment Questionnaire (ALEQ, see Paradis, Emmerzael, & Sorenson Duncan, 2010). Using the information gathered from this, participants were categorised into three groups based on their language background. Participants were allocated to the Irish-dominant homes category if they received predominantly Irish input in the home, including use with primary and secondary caregivers, siblings, friends and in extra-curricular activities. Participants were categorised as being from bilingual homes if they received a significant proportion of their input in English as well as Irish at home. The relative proportion of reported Irish and English usage in these types of homes ranged from 30:70 to 50:50 of primary caregiver language use. The 'one-parent, one-language' strategy was among those reported in such households, but more frequently a mixture of Irish and English in the input from both parents was reported. Participants were categorised as being from English-dominant homes if they received very little or no Irish input at home. Table 1 presents the distribution of the child participants according to language background categorisation and age.

INSERT TABLE 1 ABOUT HERE

All participants were attending Irish-medium schools, having started about age 4 and all but one of the schools recruited for this study were located in official *Gaeltacht* areas (i.e. an area where Irish is the official language of the community, although this varies considerably between areas). The remaining school was an Irish-immersion school from a nearby large urban area in an English-speaking district. Formal teaching of Irish in *Gaeltacht* schools focuses on teaching reading and writing skills in the language. While no data were collected on how much time is spent in *Gaeltacht* schools on teaching Irish grammar, Ní Chuaig's (2016) study of an intervention in these schools to help develop children's Irish writing skills found that many of the teachers interviewed reported that they were not themselves confident in aspects of Irish grammar, and as a result tend not to teach it formally.

Parents' report of their occupation was used to group children in three levels of socioeconomic status (SES); where these data were missing, parents were assumed to be from a lower SES group if their child attended a school which was designated as disadvantaged by the Department of Education and Skills (DEIS status). The sample was evenly distributed across high, medium and low SES.

Information was also gathered on parents' own language background and Irish proficiency, using the Brief-Language Background Questionnaire (B-LBQ; a measure adapted for the Irish situation from the Bilingual Dominance Scale by Dunn & Fox Tree, 2009). The parents were categorised according to whether they themselves had acquired Irish in the home, or as an L2 in school or outside the home. L2 speaker parents were further categorised as either highly/moderately proficient or low proficiency/non-Irish speakers, according to their own ratings of their proficiency in Irish understanding, reading, writing and speaking. Irish is an obligatory subject in primary and post-primary education, and therefore the majority of parents, particularly those living in the *Gaeltacht*, are likely to have studied Irish in school (Mac Gréil & Rhatigan, 2009). Nevertheless, about a third of the parents on whom data were collected reported very low proficiency or no proficiency at all. For presentation here, these parents are combined with parents who reported having never learned Irish. Table 2 presents a summary of the distribution of parents according to language background, age and sex.

INSERT TABLE 2 HERE

The teachers of the children who participated were also asked to complete the B-LBQ regarding their own language background. Over half (57%) of the teachers participating were categorised as native speakers as they had acquired Irish as their L1 in the home and reported a current high proficiency in Irish. Another 30% of teachers were categorised as highly proficient L2 speakers, having acquired Irish outside of the home and rating their own Irish skills as being highly proficient (the remainder were missing data). Table 3 presents a summary of the distribution of teachers according to language background and age.

INSERT TABLE 3 HERE

Materials

Two sets of tests were developed, the first examining receptive knowledge of semantic and grammatical gender marking, and the second examining production. The tests are summarised first, followed by the procedure.

The Receptive Measure of Irish Morphosyntax (R-MIM)

This measure was designed to test children's ability to distinguish between referents on the basis of gender marking in different contexts.

R-MIM Subtest 1: Subject Pronouns: Gender assignment for human nouns (14 items).

Participants were shown pictures of human nouns and asked to circle the appropriate matching pronoun from a choice of *sé* 'he', *sí* 'she' and *Níl a fhios agam* 'I don't know'.

R-MIM Subtest 2: Object Pronouns: Gender assignment for inanimate nouns (8 pairs).

Participants were presented with two pictures of inanimate objects (one masculine and one feminine) side by side, and underneath they saw a sentence with either a masculine or feminine object pronoun (e.g. *Chonaic Marcas é/í* 'Marcas saw it' [where *é* = Pron-Obj masc.; and *í* = Pron-Obj fem.]), as well as the option *Níl a fhios agam* 'I don't know'. Participants were asked to circle the picture of either the masculine or feminine inanimate object to match the pronoun in the sentence, or else to indicate that they did not know.

R-MIM Subtest 3: Third person possession marking for animate nouns (14 pairs)

Participants were shown pictures of a male and female possessor who were named (e.g. *Rí agus Banríon* 'King and Queen') and asked to indicate the possessor appropriate for the sentence they heard expressing third person possession (e.g. *Feicim a chóta/a cóta* 'I see his/her coat').

R-MIM Subtest 4: Third person possession marking for inanimate nouns (8 pairs)

The same procedure as Subtest 3 was used but all nouns, including the possessor nouns, were inanimate (e.g. door and window: 'I see its (door's/window's) glass').

R-MIM Subtest 5: Gender assignment for animals (32 items)

Following the procedure used in Belacchi and Cubelli (2012), participants were asked to look at pictures of animals and circle the subject pronoun that would be appropriate to the noun from a choice of *sé* 'he', *sí* 'she' and *Níl a fhios agam* 'I don't know'.

The Expressive Measure of Irish Morphosyntax (E-MIM)

This measure of productive gender marking was modeled on that developed by Thomas and Gathercole (2007) for Welsh. The target nouns were chosen from those consonant-initial nouns which allow gender marking on the initial phoneme. Each of the selected phonemes was tested 4 times, twice with masculine nouns and twice with feminine nouns. The nouns were equally divided between animate and inanimate nouns. Word frequency was controlled by restricting stimulus noun choice to a set of the 1000 most frequent nouns from a corpus of the most frequent words in Irish children's books.

E-MIM Subtest 1: Grammatical gender following the definite article (28 items)

This test measured noun gender assignment marking following the definite article for animate and inanimate nouns.

E-MIM Subtest 2: Noun-adjective combinations (32 items)

This test measured noun gender assignment marking following the definite article and agreement on the adjective for animate and inanimate nouns.

E-MIM Subtest 3: Third person singular possession (28 items)

This test measured the use of grammatical gender to mark third person singular possession by animate and inanimate possessors.

Procedure

The Receptive Measure of Irish Morphosyntax (R-MIM) was administered to participants in small groups, where each participant was given an individual Answer Booklet. A video of a hand puppet, ‘Marcas from Mars’, was used to give instructions. For each subtest, the puppet gave the instructions in Irish and the researcher provided any clarifications required by the participants (also in Irish). Following the completion aloud of sample items, participants individually completed the receptive test items in the Answer Booklet. All stimuli were presented as pictures with minimal reading or writing required.

The Expressive Measure of Irish Morphosyntax (E-MIM) was administered to participants individually. Participants were shown the stimuli pictures on the researcher’s laptop. The following response format was modelled first using sample items which could not be gender marked because of their initial consonant, before commencing testing using the same format with nouns that could be marked for gender:

Researcher: *Ó tháinig Marcas anseo ó Mars tá sé tar éis a lán rudaí a fheiceáil. Féach ar an gceann seo. “Chonaic Marcas an leaba”. Céard faoin gceann seo?* ‘Since Marcas arrived here from Mars he has seen lots of things. Look at this one. “Marcas saw the bed.” What about this one?’

If the child said *Chonaic Marcas an lámh* ‘Marcas saw the hand’, the child continued to the test items. Following the models offered for each subtest. If the child said anything else the researcher offered a prompt and repeated the modeling until the participant used the format accurately (up to 5 practice items).

Participants were then required to give their responses aloud to each test item. Responses were recorded on a digital recorder and on a scoring sheet.

As part of the test battery, children were also administered the Weschler Abbreviated Scales of Intelligence, a test of Irish reading vocabulary from *An Triail Ghaeilge Dhroim Conrach do Bhunscoileanna Gaeltachta agus Lán-Ghaeilge* [Drumcondra Irish Reading Vocabulary Test for *Gaeltacht* and Irish-medium schools], and a test of English reading vocabulary from The Drumcondra Primary Reading Test-Revised. A full discussion of the results of these measures is beyond the scope of this paper, but the scores were entered into some of the analyses reported below.

Scoring

When scoring the receptive tests (R-MIM 1–5), a total score was calculated for each subtest, in addition to a percentage correct score to facilitate cross-subtest comparison. When scoring the production tests (E-MIM 1–3), a percentage correct score was also calculated. However, given that there is an unmarked default in all contexts of grammatical gender use tested, participants could appear to be correct on half of the items if they use a ‘mark nothing’ default, but have limited accuracy in grammatical gender marking. In order to determine actual accuracy, a total score for nouns requiring either lenition, /t-/ prefixing or /h-/ prefixing be marked was calculated for each subtest.

Results

The first aim was to gather data on the accuracy of gender marking among a sample of *Gaeltacht* children aged 6–13 and to examine the impact of differences in home language experience and age on their accuracy in grammatical gender marking. Looking first at the receptive tests (R-MIM), Figure 1 shows the results on the five R-MIM subtests by language background and age.

INSERT FIGURE 1 ABOUT HERE

A ceiling effect was found for Subtest 1, whereby participants scored over 90% for accuracy in identifying the semantic gender of animate nouns using a Subject pronoun, regardless of language background or age. Accuracy scores were much lower for all groups of participants in the remaining receptive tests, and indeed appeared to be at chance on R-MIM Subtests 2 and 4, which indicated that the participants were guessing the gender of inanimate nouns. There was some variability between groups in the responses to Subtests 3 and 5, which required participants to identify the gender of animate nouns in the context of

third person possession and the gender of animals respectively, and these differences will be considered further below.

Looking next to the productive tests, Figure 2 shows the results of the three E-MIM subtests by language background and age for all nouns requiring active gender marking.

INSERT FIGURE 2 ABOUT HERE

A floor effect was found for all participants on Subtests 1 and 2, whereby fewer than 10% of nouns which required active marking were correctly marked for gender in E-MIM Subtest 1 and fewer than 1% of nouns were marked for noun-adjective agreement in Subtest 2. There was considerable variability in the responses to Subtest 3, and these differences were tested in a regression analysis.

Regression Analyses

Two standard multiple regression analyses were carried out with the scores of R-MIM Subtest 3 (receptive test of third person singular possession by animate noun possessors) and E-MIM Subtest 3 (production test of third person singular possession marking by animate and inanimate possessor nouns) as the dependent variables in each case, as these were the only subtests which showed variability between the age groups and/or language backgrounds. Before each regression, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Language background and age were included as predictor variables for each analysis as they were the primary variables in the research. Correlational analyses were used to assess the strength of the relationship between each of the variables (see Appendix) and were used to exclude from the analysis those variables that had too low a correlation with the dependent variable or which were too highly intercorrelated with other independent variables. In reporting the results of the regression analyses below, the set of predictor variables entered is specified in each case.

R-MIM Subtest 3: Receptive test of 3rd person singular possession marking (animate Noun possessors)

A standard multiple regression analysis was conducted to calculate how much of the variance in scores on the receptive test of third person singular possession marking (R-MIM Subtest 3) was accounted for by the following independent variables: child home language background, age, socioeconomic status, non-verbal IQ, Irish vocabulary score (on Drumcondra standardised test), English vocabulary score (on Drumcondra standardised test)

and performance on E-MIM Subtests 1 and 3.¹ When all of these variables were entered into the model, the total variance explained was 22.9%, $F(3, 188) = 15.20$, $p < .001$. Only two variables made a unique contribution to this model, and these were age ($\beta = .300$, $p < .001$) and Irish vocabulary score ($\beta = .254$, $p < .001$).

The results of this model show that age was the strongest predictor of accuracy in identifying the semantic gender of animate nouns when identification of gender was dependent on how lenition is used to mark third person possession, with older children showing higher accuracy on this test. The second strongest predictor was size of Irish reading vocabulary, in that higher Irish reading vocabulary scores predicted more accurate performance on R-MIM 3 in identifying the semantic gender of animate nouns functioning as possessors in third person possession marking.

E-MIM Subtest 3: Productive test of third person possession (singular) marking.

A standard multiple regression analysis was conducted to calculate how much of the variance in accuracy on E-MIM Subtest 3 was accounted for by the variables: child language background, age, parental language background, percentage of pupils in the school being raised in Irish-dominant homes, school model (*Gaeltacht* school or immersion-school), Irish reading vocabulary scores and English reading vocabulary scores. As shown in Figure 2, there were large differences in mean accuracy in the tests of grammatical gender assignment following the definite article (E-MIM 1) and in agreement in noun-adjective combinations (E-MIM 2) compared to the test of third person singular possession marking (E-MIM 3), regardless of language background or age. Because of that, and the finding that the scores from E-MIM 1 and E-MIM 2 were not too highly intercorrelated with E-MIM 3 (at .34 and .24 respectively), they were included as predictor variables in this model in order to test whether accurate marking of grammatical gender assignment and agreement appears to predict or be relatively independent of accuracy in marking third person singular possession.

All the variables listed above were entered into the model, which was significant. The total variance explained was 39.5% (adjusted R^2), $F(13, 184) = 10.90$, $p < .001$. Language background was the strongest predictor of scores on the production test E-MIM 3, followed by scores on E-MIM 1 ($\beta = -.239$, $p < .001$), age ($\beta = -.174$, $p < .008$) and E-MIM 2 ($\beta = .134$, $p < .024$), as shown in Table 4.

INSERT TABLE 4 ABOUT HERE

The results for language background indicate that, when the scores of participants from Irish-dominant homes were compared with others, they were significantly more accurate than the children both from English-dominant homes ($\beta = -.475, p < .001$) and from bilingual homes ($\beta = -.395, p < .001$). Thus, children from Irish-dominant homes marked third person singular possession most accurately, followed by participants from bilingual homes, with the lowest scores among the children from English-dominant homes. Thus, for this measure the language used in the home significantly affected accuracy.

Interestingly, it was performance on E-MIM Subtest 1, i.e. accuracy in gender assignment, which was the next strongest predictor of accuracy in marking gender in third person possession. Accuracy on E-MIM 1 uniquely explained 6% of the variance in scores on E-MIM 3. Age was next, but surprisingly it was lower age that predicted higher accuracy on this measure. The partial correlations indicate that age uniquely explained just 2% of the variance in accuracy on E-MIM 3.

The last significant variable in the model was performance on E-MIM Subtest 2, indicating that higher accuracy in achieving agreement in noun-adjective combinations predicted higher accuracy in marking third person possession, although this variable made a unique contribution of just 1.5% to the explanation of variance in E-MIM 3 scores. The fact that performance in E-MIM Subtests 1 and 2 remained as significant predictors of performance on E-MIM Subtest 3 confirmed that, despite the overall scores on those subtests being very low, it appears that accuracy in the productive use of grammatical gender in marking third person possession is related to performance in the other two contexts of gender marking following the definite article and in noun adjective combinations, although third person possession marking shows greater development.

Comparing accuracy of gender marking on animate and inanimate nouns

The third research question focused on a finer-grained analysis of which aspects of the system appear to support or impede acquisition. The results thus far have shown the influence of the context of grammatical gender marking on the extent to which that context of use has been acquired. The next set of results pertain to differences in the successful marking of gender for animate and inanimate nouns. The results of the receptive tests (R-MIM) in Figure 1 showed a higher level of accuracy in the identification of the semantic gender of human nouns for all participants, regardless of language background or age (R-MIM 1: Mean for all participants = 98.15%, $SD = 6.62$), but slightly more variable accuracy for animal terms (R-MIM 5: Mean for all participants = 54.57%, $SD = 9.13$), while performance was at chance levels for inanimate

nouns (R-MIM 2: Mean for all participants = 47.15%, $SD = 16.05$). However, semantic gender appeared to play only a small part, if any, in facilitating gender assignment in third person singular possession, since accuracy for semantic gender of human noun possessors (R-MIM 3: Mean for all participants = 57.22, $SD = 33.1$) was only somewhat better than for inanimate noun possessors (R-MIM 4: Mean for all participants = 50.82, $SD = 17.46$).

The results of E-MIM Subtest 3 were further analysed in order to compare accuracy for animate and inanimate nouns. Figure 3 shows the percentage correct scores for accurate marking of those animate (human and animal) nouns (6) and inanimate nouns (8) which required lenition (all consonant-initial feminine nouns) or /t-/ prefixing (s-initial feminine nouns and vowel-initial masculine nouns) for Subtest 1. Figure 3(a) shows the mean percentage correct scores for the animate nouns by language background and age, while Figure 3(b) shows the breakdown for inanimate nouns.

INSERT FIGURE 3 ABOUT HERE

While there had been an advantage for gender marking on (human more than animal) animate nouns in the receptive tests, no advantage was evident in grammatical gender marking on animate compared to inanimate nouns in the production test. First, overall percentage correct scores were very low for both animate (maximum 8%) and inanimate nouns (maximum 16%) among both age groups and all language backgrounds, but as Figure 3 shows, it was inanimate nouns rather than animate ones that showed somewhat better accuracy. Examination of individual items showed that children tended to score much better on a small number of individual and high-frequency inanimate nouns (*fiacail* ‘tooth’, *fuinneog* ‘window’ and *bróg* ‘shoe’). This may point to item-based learning of these nouns, and when set against the overall low levels of accuracy, indicate that they are being treated as exceptions rather than as part of a rule-based strategy.

E-MIM Subtest 2 was not reanalysed as accuracy scores were very low with only rare instances of grammatical gender agreement on adjectives. The data in E-MIM Subtest 3 were reanalysed, separating the scores for all animate nouns (6) and inanimate nouns (7) requiring lenition (all masculine noun possessors of consonant-initial nouns) or /h-/ prefixing (all feminine noun possessors of vowel-initial nouns). Figure 4 shows the scores by language background and age, with Figure 4(a) showing the results for animate, and Figure 4(b) the results for inanimate nouns.

INSERT FIG 4 ABOUT HERE

These results correspond with the R-MIM results in showing an advantage for animate over inanimate nouns. Overall, in achieving grammatical gender agreement in marking third

person singular possession, accuracy for animate noun possessors was greater than for inanimate noun possessors across all language backgrounds.

Overall, in marking possession by both animate nouns and inanimate nouns, the participants from Irish-dominant homes were more accurate than those from bilingual homes, who in turn were more accurate than those from English-dominant homes. The accuracy in productive use of gender marking in the context of third person possession by the participants from Irish-dominant homes was equivalent to performance on R-MIM Subtest 3. It may be that the animacy of the possessor noun increases the salience of the lenition used in marking (masculine) third person singular possession in a way that the inanimate nouns do not. It seemed that the children's understanding of third person possession marking was dependent on animacy for both age groups, where animate noun possessors were more likely to be correctly marked for third person singular possession than inanimate nouns. However, it was only the participants with the highest home exposure to Irish (from Irish-dominant homes) who showed limited success in extending this marking to possession by inanimate nouns (e.g. 'the car's wheel – its wheel'), and there was no evidence of increased accuracy on this among them by the age of 13.

Discussion

Extensive cross-linguistic research has shown that successful language acquisition is highly dependent on language input and experience. This study collected data on the acquisition of Irish, a threatened minority language, with the primary aim of examining the accuracy of grammatical gender marking in Irish among *Gaeltacht* children aged 6–13 from Irish-dominant, bilingual or English-dominant homes. The second aim was to consider the contribution of functional salience and structural complexity to supporting or impeding acquisition of grammatical gender marking. It was hypothesised that the opacity of the Irish grammatical gender system, in conjunction with universal bilingualism in a language without grammatical gender, would make its acquisition vulnerable. The results of the present study support this hypothesis.

Relative advantage for those raised with Irish as their L1

The results show relatively more accurate use of grammatical gender marking among those with the most Irish exposure in the home, but accuracy scores did not point to the acquisition of gender marking being complete, even among the older participants in this sample aged 12–13. The results of the receptive tests of Irish gender marking point to

most of these participants showing a strong understanding of semantic gender in human animate nouns, a weaker representation of grammatical gender for animal nouns and the weakest representation of grammatical gender for inanimate nouns. Language background did influence children's performance on the measure of receptive knowledge of gender marking, with more accurate scores among those with the most Irish exposure in their homes, but with evidence that acquisition of gender marking was secure only for semantic gender, and otherwise far from complete. Turning from receptive to production scores, the results are similar, as they also point to relatively more advanced, but ongoing, acquisition of grammatical gender assignment and agreement among the participants being raised with Irish as the primary language in the home, but even their performance appeared to be item-based and patchy rather than rule-based and consistent as might be expected of L1 speakers.

One explanation for the participants' relatively more accurate performance in marking third person singular possession than in grammatical gender assignment may be the greater salience, arising from functional necessity, of gender in marking possession. Marking agreement in third person possession is more likely to be crucial to communication, since the Irish possessive pronoun is not gender-specific (*a* 'his/her/its'), depending on the presence or absence of lenition of the possessed noun to signal the gender of the possessor noun. This, and the fact that possessor nouns are often at least animate (and often human), may help to increase the salience of this feature for children, and may help to explain why participants from Irish-dominant homes at least showed variably successful performance on this task. Thus, it appeared that functional necessity interacted with structural complexity in facilitating acquisition of this part of the system.

Successful acquisition "timed off the map"

One of the most notable findings overall in these data was the minimal difference between the accuracy of the younger and older participants. Not only does it appear that the Irish exposure experienced by *Gaeltacht* children is insufficient – or insufficiently consistent – for them to acquire the complexity of Irish grammatical gender marking by age 6, but even the additional exposure to formal schooling through Irish in the primary school years between the ages of 6 and 12 does not appear to lead to significant progress beyond marking semantic gender, with some variable marking of masculine third person possession, and learning to mark a small number of feminine nouns as exceptions. Lieven and Brandt (2011) observed that when a particular grammatical function can be enacted using multiple forms, or a specific language form

can signal multiple functions, depending on fine-grained decisions made by the speaker, acquisition will be prolonged, since the learner needs an extended period of acquisition to abstract the rules for every form–function mapping possibility, potentially on an item-by-item basis. This appears to be supported by the Irish results, as even the oldest children tested showed low levels of accuracy in the form–function mapping of third person singular possession marking on inanimate nouns.

Gathercole and Thomas (2009) argued that children need a ‘critical mass’ of input to construct a formal, abstract representation of their language. They hypothesised that if quantity of input was the critical factor, then, all else being equal, and given sufficient input in school to compensate for lower exposure at home, older children would be expected by middle childhood to perform like their younger peers who have greater home exposure. However, they noted that achieving a critical mass of input is particularly problematic for bilinguals acquiring a minority language. Gathercole (2007) raised the issue of timing with regard to the length of the period needed to reach critical mass for opaque structures in Welsh, and noted the risk that if bilingual children’s access to input for these formally complex and opaque structures is insufficient, their acquisition of such structures may be ‘timed off the map’ (p. 242). Thus, if children do not receive the critical mass of input to them on which to base their analysis or extraction of specific aspects of grammar such as grammatical gender (with greater formal complexity and plurifunctionality necessitating more input), then some aspects of particular grammatical structures may not be successfully acquired, even for children who appear to have an overall high proficiency in that language.

This has implications over time for simplification in a minority language. Frenda (2011) argued that convergence with English in Irish has reinforced those linguistic structures shared by both languages, but undermined those structures in the minority language which English does not share, such as grammatical gender marking on inanimate nouns, marked by initial mutations in Irish. Both Irish and Welsh are minority languages experiencing declining numbers of native speakers and rising numbers of L2 speakers whose first language does not have grammatical gender. However, a crucial difference, identified by Gathercole (2007), is that the Welsh language community in Wales is relatively stable: that is, not experiencing a decrease in the number of speakers or domains of use due to pressure from the majority language English, which she argued was one of the reasons for the children’s eventually successful acquisition of grammatical gender. In contrast, Péterváry et al. (2014), Lenoach (2014) and Ó Giollagáin (2014) have argued that the instability of the Irish community has

contributed to what they have identified as incomplete acquisition of Irish among children from Irish-dominant homes in the *Gaeltacht*.

Within languages, level of exposure is clearly critical. Sharp (2013) found that children's exposure to Welsh significantly affected their acquisition of grammatical gender assignment and agreement. However, she also found that the children acquiring Welsh in Welsh–English homes performed more like those in Welsh-only homes than those in English-only homes, pointing to the children in bilingual homes receiving enough input to acquire the Welsh system. In contrast, in the Irish data on gender marking, children acquiring Irish in bilingual homes scored more like those in English-dominant homes than those in Irish-dominant homes.

Consequently, we see in Irish the combination of a highly complex and opaque gender marking system that requires a lengthy period of exposure before critical mass is achieved, and a situation of reduced input resulting from declining numbers of native speakers and increasing influence from English, given the now universal bilingualism of Irish speakers

Recommendations

Irish has seen many waves of revitalisation efforts over the last century. Currently, Irish has limited domains of use for adults and children even in *Gaeltacht* areas. The results here demonstrate that exposure in the home does matter, but that children raised as Irish speakers also need more targeted intervention to support their L1. The acquisition of the more complex aspects of their language, such as grammatical gender, by these children requires more active supports for Irish-dominant families and the implementation of appropriate curricula and focus-on-form approaches (Ní Dhíorbháin, 2014) developed for *Gaeltacht* schools.

Until recently, despite the efforts of parents raising their children with Irish as the primary language of the home, the unique needs of children from Irish-dominant and bilingual homes have been largely unrecognised by national entities, or have been deemed less urgent than those of L2 learners of Irish. Recently, there has been some promise of improvement in addressing the needs of Irish speakers, with the publication of, and consultations on, a new policy for education in the *Gaeltacht* by the Department of Education and Skills (2016). The initial proposals for *Gaeltacht* school reform were widely debated and amended in light of consultations, and now offer somewhat more possibilities for the provision of language enrichment and targeted intervention for home-generated speakers of Irish than was originally proposed.

Such educational reform needs to be accompanied by language planning discussions in communities that aim to deepen and extend *Gaeltacht* parents' understanding of bilingualism in a minority language context. Ideally, this would be accompanied by enhanced provision of systematic and specific family language support to Irish-speaking families from birth and throughout the primary school years, in order to address these children's particular and ongoing language needs and to inform parents of the benefits of progressing and consolidating acquisition of the minority language as far as possible before exposure to English begins. Furthermore, *Gaeltacht* parents who are proficient in Irish but currently choose to raise their children in English-dominant homes need more support and information on which to base their family language planning, to develop greater awareness among this group that acquisition of the majority language is not at risk, whereas the outcomes in terms of their children's proficiency in the minority language are likely to be significantly lower, conferring fewer cognitive benefits of bilingualism.

The results of this study point to children with higher levels of Irish exposure showing accuracy levels that are relatively more advanced than their peers from bilingual or English-dominant homes, but their acquisition of grammatical gender is still ongoing at the end of primary school, and is in danger of being timed off the map. The standard and status of Irish spoken by the current generation of L1 speaker children has regrettably become a highly contested space: they are at risk of being viewed as deficient in not meeting the language standards of previous generations, when the input to them, and conditions around them have changed significantly and they are, in fact, urgently in need of the linguistic supports too long denied them by a system that appeared to take them for granted, while prioritising L2 learners. Children acquiring Irish in Irish-dominant and bilingual homes at present are in urgent need of effective and coordinated action to enable their families and schools to provide the enriched input, appropriate resources, and supports that they need to develop linguistically and cognitively, developing both their identity and authority as Irish speakers.

Note

1. The correlation matrix showed that while there were some significant correlations between subtests of the R-MIM and the E-MIM, none of these exceeded .34 and therefore were not considered to be too highly intercorrelated for inclusion in the regression analyses (Pallant, 2010).

References

- Alarcón, I. (2011). Spanish gender agreement under complete and incomplete acquisition: Early and late bilinguals' linguistic behaviour within the noun phrase. *Bilingualism: Language & Cognition*, 14(3), 332-350.
- Belacchi, C., & Cubelli, R. (2012). Implicit knowledge of grammatical gender in preschool children. *Journal of Psycholinguistic Research*, 41, 295-310.
- Berman, R.A. (2007). Developing linguistic knowledge and language use across adolescence. In E. Hoff & M. Shatz (Eds.), *The Blackwell Handbook of Language Development* (pp. 347-3367). Oxford, UK: Blackwell Publishing Ltd.
- Blom, E., Polisenska, D., & Weerman, F. (2008). Articles, adjectives and age of onset: The acquisition of Dutch grammatical gender. *Second Language Research*, 24(3), 297-331.
- Boloh, Y., & Ibernón, L. (2013). Natural gender, phonological cues and the default grammar gender in French children. *First Language*, 33(5), 449-468.
- De Houwer, A. (2007). Parental language input patterns and children's bilingual use. *Applied Psycholinguistics*, 28, 411-424.
- Department of Education & Skills (2016). *Policy on Gaeltacht Education 2017-2022*. Available from <https://www.education.ie/en/Publications/Policy-Reports/Policy-on-Gaeltacht-Education-2017-2022.pdf>.
- Desrochers, A. & Brabant, M. (1995). Interaction between phonological and semantic factors in a lexical categorization task. *Canadian Journal of Experimental Psychology*, 49(2), 240-263.
- Dunn, A.L., & Fox Tree, J.E. (2009). A quick, gradient Bilingual Dominance Scale. *Bilingualism: Language & Cognition*, 12(3), 273-289.
- Frenda, A.S. (2011). Gender in Irish between continuity and change. *Folia Linguistica*, 45(2), 283-316.
- Gathercole, V.C.M. (2014). Bilingualism matters: One size does not fit all. *International Journal of Behavioural Development*, 38(4), 359-366.
- Gathercole, V.C.M. (2007). Miami and North Wales, so far and yet so near: A constructivist account of morphosyntactic development in bilingual children. *International Journal of Bilingual Education & Bilingualism*, 10(3), 224-247.
- Gathercole, V.C.M. (2002). Grammatical gender in bilingual and monolingual children: A Spanish morphosyntactic distinction. In D.K. Oller & R.E. Eilers (Eds.), *Language & Literacy in Bilingual Children* (pp. 207-219). UK: Multilingual Matters Ltd.
- Gathercole, V.C.M., & Thomas, E.M. (2009). Bilingual first-language development: Dominant language takeover, threatened minority language take-up. *Bilingualism: Language & Cognition*, 12(2), 213-237.
- Gilleece, L., Shiel, G., Clerkin, A., & Millar, D. (2012). *The 2010 National Assessments of English Reading and Mathematics in Irish-Medium Schools*. Main report. Dublin: Educational Research Centre.
- Grosjean, F. (2010). *Bilingual: Life and Reality*. Cambridge, Mass: Harvard University Press.
- Hickey, T.M. (2012). ILARSP: A grammatical profile of Irish. In M.J. Ball, D. Crystal & P. Fletcher (Eds.), *The Languages of LARSP* (pp. 149-166). Clevedon, Avon: Multilingual Matters.
- Hickey, T.M. (1999). *Luathoidreachas trí Ghaeilge sa Ghaeltacht [Early Education through Irish in the Gaeltacht]*. Dublin: Údarás na Gaeltachta agus Institiúid Teangeolaíochta Éireann.
- Karmiloff-Smith, A. (1979). *A Functional Approach to Child Language: A Study of Determiners & Reference*. Cambridge: Cambridge University Press.

- Lenoach, C. (2014). Sealbhú neamhiomlán na Gaeilge mar chéad teanga sa dátheangachas dealaitheach [Incomplete acquisition of Irish as a first language in subtractive bilingualism]. Doctoral dissertation, Ollscoil na hÉireann Gaillimh/National University of Ireland Galway.
- Lieven, E., & Brandt, S. (2011). The constructivist approach. *Infancia y Aprendizaje*, 34, 381–396.
- Mac Donnacha, S., Ní Chualáin, F., Ní Shéaghdha, A., & Ní Mhainín, T. (2004). *Staid Reatha na Scoileanna Gaeltachta: A Study of Gaeltacht Schools 2004*. Dublin, Ireland: Tuairisc don Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta.
- Mac Gréil, M., & Rhatigan, F. (2009). *The Irish Language and the Irish People: Report on the attitudes towards competence in and use of the Irish Language in the Republic of Ireland in 2007-08*. Report prepared for Survey and Research Unit, Department of Sociology, National University of Ireland, Maynooth.
- Montrul, S., & Potowski, K. (2007). Command of gender agreement in school-age Spanish–English bilingual children. *International Journal of Bilingualism*, 11, 301–328.
- Ní Chuaig, N. (2016). *Iniúchadh ar chleachtais literarthachta i gcóras bunscolaíochta Chatagóir A na Gaeltachta: Cur chuige praiticiúil d'fhorbairt na scríbhneoireachta. [An examination of literacy practices in Gaeltacht Category A primary schools: A practical approach to developing writing skills]* Unpublished Ed.D dissertation, St. Patrick's College/Dublin City University.
- Ní Dhiorbháin, A. (2014). *Bain Súp As! Treoir Nua maidir le Múineadh na Gramadaí. [Give it a go! A new direction in the teaching of grammar]*. Dublin/ Baile Átha Cliath: COGG/An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta.
- Ó Duibhir, P. (2011). “I thought that we had good Irish”: Irish immersion students’ insights into their target language use. In D.J. Tedick, D. Christian & T.W. Fortune (Eds.), *Immersion Education: Practices, Policies, Possibilities* (pp. 145-165). UK: Multilingual Matters.
- Ó Duibhir, P., Ní Dhiorbháin, A. & Cosgrove, J. (2016). An inductive approach to grammar teaching in Grade 5 & 6 Irish immersion classes. *Journal of Immersion and Content-Based Language Education*, 4(1), 33-58.
- Ó Giollagáin, C. (2014). Unfirm ground: A re-assessment of language policy in Ireland since Independence. *Language Problems & Language Planning*, 38(1), 19-41.
- Pallant, J. (2010). *SPSS Survival Manual (4th Ed.)*. UK: Open University Press.
- Paradis, J. (2011). The impact of input factors on bilingual development: Quantity versus quality. *Linguistic Approaches to Bilingualism*, 1(1), 67-70.
- Paradis, J., Emmerzael, K., & Sorenson Duncan, T. (2010). Assessment of English language learners: Using parent report on first language development. *Journal of Communication Disorders*, 43, 474-497.
- Paradis, J., Tremblay, A., & Crago, M. (2014). French-English bilingual children’s sensitivity to child-level and language-level input factors in morphosyntactic acquisition. In T. Gruter & J. Paradis (Eds.), *Input and Experience in Bilingual Development* (pp. 161-180). Amsterdam: John Benjamins Publishing Company.
- Péterváry, T., Ó Curnáin, C., Ó Giollagáin, B., & Sheahan, J. (2014). *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]*. Baile Átha Cliath: Partners in Print, Ltd.
- Rodina, Y., & Westergaard, M. (2013). The acquisition of gender and declension class in a non-transparent system: Monolinguals and bilinguals. *Studia Linguistica*, 67(1), 47-67.

- Sharp, K.M. (2013). *Morphosyntactic Complexity and Exposure in the Acquisition of Gender in Welsh*. Doctoral thesis, Bangor University.
- Stenson, N. (1981). *Studies in Irish Syntax* (Vol. 8). Gunter Narr.
- Thomas, E.M., & Gathercole, V. (2007). Children's productive command of grammatical gender and mutation in Welsh: An alternative to rule based learning. *First Language*, 27(3), 251-278.
- Thordardottir, E. (2014). The typical development of simultaneous bilinguals. In T. Gruter & J. Paradis (Eds.), *Input and Experience in Bilingual Development* (pp. 141-160). Amsterdam: John Benjamins Publishing Company.
- Thordardottir, E. (2011). The relationship between bilingual exposure and vocabulary development. *International Journal of Bilingualism*, 15(4), 426-445.
- Unsworth, S. (2013a). Current issues in multilingual first language acquisition. *Annual Review of Applied Linguistics*, 33, 21-50.
- Unsworth, S. (2013b). Assessing the role of current and cumulative exposure in simultaneous bilingual acquisition: The case of Dutch gender. *Bilingualism: Language & Cognition*, 16(1), 86-110.

Tables**Table 1.** Child sample by language background and age.

Age	Irish Dominant Home		Bilingual Home		English Dominant Home		Total	
	n	%	n	%	n	%	n	%
6	1	.3	0		0		1	.3
7	13	4	14	4.5	6	2	33	11
8	25	8	18	6	12	4	55	18
9	21	7	21	7	37	12	79	26
6-9	60	20	53	17.3	55	18	168	55
10	20	6.5	19	6.2	30	10	69	22.5
11	11	3.6	5	1.6	27	9	43	14
12	3	1	3	1	10	3	16	5
13	1	.3	1	.3	0		2	.6
10-13	35	11	28	9	67	22	130	42
Missing	N/A	N/A	N/A	N/A	N/A	N/A	8³	
Total	95	31	81	26.5	122	40	306	

³Language background information was not received for these participants. They were distributed to the age group most typical for their school class, and categorised conservatively in the Bilingual Home group.

Table 2. Respondent parents of child participants by language background, sex and age

Identity	Age	Native Speaker		L2 High/ Moderate Proficiency		L2 Low Proficiency/ Non-Irish speaker		Total	
		n	%	n	%	n	%	n	%
Mother	<25	2	.7	0		1	.3	3	1
	26-35	16	6	9	3	18	7	43	16.5
	36-45	52	20	26	10	57	22	135	52
	46-55	14	5	11	4	10	4	35	13.4
	Total	84	32	46	18	86	33	216	83
Father	36-45	1	.3	1	.3	6	2	8	3
	46-55	3	1	3	1	0		6	2.3
	Total	4	1.5	4	1.5	6	2	14	5.3
Total	<25	2	.7	0		1	.3	3	1
	26-35	16	6	9	3	18	7	43	16.5
	36-45	53	20	27	10	63	24	143	55
	46-55	17	6.5	14	5	10	4	41	16
Missing		N/A	N/A	N/A	N/A	N/A	N/A	31	12
	Total	88	34	50	19	92	35	261	

Table 3. Teachers of child participants by language background and age

Age	Native Speaker		Highly speaker	Proficient L2	Total	
	n	%	n	%	n	%
26-35	6	20	3	10	9	30
36-45	5	17	3	10	8	27
46-55	5	17	3	10	8	27
55+	1	3	0	N/A	1	3
Missing	N/A	N/A	N/A	N/A	4	13
Total	17	57	9	30	30	100

Table 4. Outcome of regression on E-MIM Subtest 3.

	Unstandar d. Beta	Standar d. Beta	<i>p</i>	CI Lower	Upper	Part Correlati on	Toleran ce
English Dominant Home	-15.64	-.475	.001* *	-22.75	-8.54	-.241	.256
Bilingual Home	-14.38	-.395	.001* *	-20.31	-8.56	-.265	.451
E-MIM Subtest 1	.39	.239	.001* *	.192	.586	.251	.816
Age	-1.99	-.174	.008* *	-3.45	-.537	-.150	.738
E-MIM Subtest 2	1.33	.134	.024*	.178	2.48	.126	.887

** when $p = .01$ * when $p = .05$ CI = Confidence Interval E-MIM =Expressive measure of Irish Morphosyntax

Figures

Figure 1. Mean scores by language background and age on receptive tests (R-MIM).

Figure 2. Mean percentage correct scores by language background on production test (E-MIM).

Figure 3. E-MIM Subtest 1 Mean percentage correct on animate and inanimate nouns requiring active gender marking by language background and age.

Figure 4. E-MIM Subtest 3 Mean percentage correct on animate and inanimate nouns requiring active gender marking by language background and age.