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A longitudinal study of early reading development in two languages: comparing literacy outcomes in Irish immersion, English medium and Gaeltacht schools

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Schools in Ireland vary in how they introduce reading in the two official languages, Irish and English. There is particular variability within immersion (Irish medium) schools. Some introduce Irish reading first (IRF) and others English reading first (ERF). This study compared the development of Irish and English skills in children attending different school types, assessing word reading, decoding and vocabulary at three time points (second, third and fourth year of schooling). Children attending Irish-medium schools and a school in an Irish-speaking (Gaeltacht) community performed significantly better than children attending an English-medium school on the Irish tasks. Differences between the IRF and ERF school children were evident only at the first time point, with IRF children showing an early advantage in decoding. Differences between the school groups on the English tasks were largely resolved by the fourth year of schooling. Comparing the Irish-medium groups on English reading, the Gaeltacht group initially lagged behind the others, but there was no difference by the fourth year of schooling. These findings suggest that the language in which reading is formally introduced is not critical to later reading attainment. Furthermore, teaching through Irish was associated with Irish language advantages, without detriment to English reading skill as measured here.

Keywords: biliteracy; immersion bilingual education; immersion education; minority languages; Irish language; Gaeltacht

Irish is the first official language of the Republic of Ireland and an official language of the European Union. However, English is the more widely used language. A substantial proportion (41%) of the population of the Republic of Ireland claim to be able to speak Irish, but just 14% report its daily use (Government of Ireland 2012). Daily usage of Irish largely occurs within educational settings. Beyond educational settings, it is estimated that just 1 in 20 Irish speakers use Irish daily (Watson and Phádraig 2011). Furthermore, the number of Irish speakers with native-like ability is estimated to be around 2%–3% of the population (Watson and Phádraig 2011). For most people, Irish is encountered as a compulsory school subject, as a second language (L2), and is infrequently used beyond the school years.

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The majority of children attending school in Ireland are schooled through English and come from monolingual English-speaking homes. Irish is encountered as a compulsory, typically second-language subject that is infrequently used beyond the school years (Murtagh 2007). A growing minority attend Irish-medium schools in English-speaking areas; a small proportion will also use Irish within the home. A further group of children attend schools within a small number of Irish-speaking or *Gaeltacht* regions. Some, but not all, of these children will use Irish at home. Finally, other children will encounter Irish and English at school, while another language is used in the home. All these children are taught to read in both English and Irish at a young age. The questions of how best to introduce Irish and English reading, so as not to disadvantage either, and how to best support learning given the diversity of language backgrounds, are therefore important.

Irish-medium education outside the Gaeltacht has seen rapid growth in the past two decades, with about 6% of all children attending Irish-medium primary schools (Department of Education and Science, Ireland 2007). Close to 5% of primary schools outside Gaeltacht areas are now Irish medium (144 schools in the Republic of Ireland), with lower percentages at post-primary level. Children attending these schools come predominantly from English-speaking homes (Ó Muircheartaigh and Hickey 2008).

While interest in Irish-medium education is growing outside the Gaeltacht, within the Gaeltacht, the acquisition and communal use of Irish is argued to be in decline (for review, see Ó Giollagáin 2014; Ó Giollagáin et al. 2007). Even in Gaeltacht regions categorised as having the highest proportion of daily Irish speakers ('strong' regions), young people report superior competencies in English than in Irish (Ó Giollagáin et al. 2007). Longitudinal evidence also indicates a decline in a number of aspects of Irish language competence in Gaeltacht schools (Harris et al. 2006). Teachers' perceptions of pupil's speaking proficiency are consistent with this evidence, with the majority reporting a decrease in average proficiency (Ó Laoire and Harris 2006).

Of the 135 primary schools in Gaeltacht areas, 104 report teaching through Irish. Recent work reported that just 60% of pupils in a sample of strong Gaeltacht areas used Irish as their first language (Ní Shéaghdha 2010). This points to the increasingly fragile status of the Irish language (Department of Education and Science, Ireland 2013). Over a quarter of pupils within Gaeltacht primary schools were born or have lived outside the Gaeltacht (Mac Donnacha et al. 2005). Gaeltacht schools tend to be small, particularly at primary level. Over two thirds of Gaeltacht primary schools are one to three teacher schools and there are often difficulties in recruiting teachers to posts within these regions.

For some children, attending a Gaeltacht school does not bring about fluency in Irish. One survey found that 10% of children who completed primary school within the Gaeltacht left with little mastery of the language (Mac Donnacha et al. 2005). Mac Donnacha et al. also noted that English is increasingly used as the main language for communication within Gaeltacht schools. This reflects the situation in the home. In Gaeltacht regions, Irish language use in the home has been found to vary considerably. A survey by Harris et al. (2006) noted that of parents of children attending Gaeltacht schools, 29% never or seldom spoke to their child in Irish. This compared with 35% for Irish-medium schools and 76% for ordinary English-medium schools. Standards of oral Irish in Gaeltacht primary school pupils have declined markedly in the past two decades (Harris et al. 2006) and just 37% of Gaeltacht parents consider themselves to have 'native speaker ability' (Harris and Cummins 2013). The proportion of children in Gaeltacht areas with fluent, native Irish has declined (Ó Riagáin 2001) and teachers are faced with considerable diversity in language ability within the Gaeltacht classroom. This has a marked effect on teaching practices, potentially disadvantaging the small number of

native speakers. For example, Harris (1984) found that in classes where native Irish speakers were in the minority, children received only about half their instruction through Irish. This is considerably less than occurs for children in Irish-medium schools and may have implications for native speakers.

In Ireland, children begin learning to read at school entry, typically at age 4–5 years. The Primary School Curriculum (PSC) specifies that Irish is taught as a second language in English-medium schools and as the first language in Gaeltacht and Irish-medium schools (Ó Duibhir and Cummins 2012). In these schools, Irish is the language through which other curriculum subjects are taught and communications is conducted. The curriculum for English is the same for all school contexts. Children attending English-medium schools will begin reading in English and will be introduced to Irish reading after 2–3 years, once their competency in English reading has been established. Children attending Irish-medium schools will typically learn to read in Irish first, but there is considerable variation as to when English reading is introduced (Harris et al. 2006; Hickey and Stenson 2011). Ní Bhaoill and Ó Duibhir (2004) reported that 58% of surveyed Irish-medium schools begin teaching reading in Irish first (here referred to as IRF – Irish reading first) and 36% began in English (hereafter ERF – English reading first), and 6% introduced both languages around the same time. Similarly, Shiel et al. (2011) found that 75% of Irish-medium school children were in schools reporting introducing IRF, 17% were in schools with English first and 11% were introduced to both at the same time. Both studies indicate diversity in reading practices in Irish-medium schools. Given this diversity, the PSC has been criticised for not meeting the needs of learners from different language contexts and also for compartmentalising languages, with little consideration of cross-language skill transfer (Ó Duibhir and Cummins 2012).

The acquisition of reading skills in Irish is further complicated by differences between Irish and English orthographies. The Irish orthography shows a high degree of regularity, particularly for early-reader words (see Hickey [2007] for a description of the Irish orthography). In brief, the Irish language uses 18 letters of the Latin alphabet, and a length diacritic on vowels to reflect at least 50 basic sounds. The orthography differentiates between pairs of slender (palatalised) and broad (non-palatalised or velarised) consonants using unpronounced vowels before/after consonants to indicate consonant quality. Initial mutations result in considerable variability in word forms of nouns, verbs and adjectives, and present complex word-initial clusters of consonants.

The Irish language has a complex rule system that is often at variance with the letter–sound correspondences of English. Letter sequences in Irish are pronounced differently from the same sequences in English. For example, the Irish ‘fear’, (meaning ‘man’) is pronounced as /far/ would be in English, and ‘bean’ (meaning ‘woman’) is pronounced as /ban/. There are many such homographs among the early word set (for examples, see Lyddy 2012). In addition, children rarely receive explicit instruction on Irish orthography or Irish sound–symbol correspondences, which might alert the child to the similarities, and key differences, between Irish and English writing (Hickey and Stenson 2011). Hickey and Stenson (2011, 37) sum up the challenge for the beginning reader of Irish:

> while Irish spelling may indeed be more regular than that of English at least in early reader texts ... the complexity and unfamiliarity to L2 readers of the rules underlying that regularity make Irish orthography as difficult as that of English, and particularly difficult for native English speakers already literate in that language; one cannot assume that L2 readers will simply pick up Irish with the ease with which more nearly phonemic orthographies like Welsh and Spanish can be learned.

How then might Irish reading be introduced to children, from different language backgrounds, so as to best support biliteracy? Here, we focus on the sequencing of instruction in the two languages. There is some evidence from other bilingual settings that dual-language learning during the same developmental period might provide some reading advantages (e.g. see Berens, Kovelman, and Petitto 2013; Montanari 2014). However, biliteracy in the Irish context is complicated by many factors including the complexity of the orthographic rules, the lack of correspondence with rules in English, the lack of explicit instruction on these rules and the relatively low support within the home and community. Kenner (2005), noting the importance of family support for biliteracy, refers to bilingual families as 'literacy ecosystems'; most children learning to read in Irish will not use Irish outside school and may receive low support of Irish reading from parents without fluent Irish.

Immersion schools in countries such as Canada and Wales generally introduce reading in the language of instruction (French or Welsh, respectively) initially. In Canada, for example, the French immersion model promotes French reading with English introduced subsequently, usually in the third or fourth year of schooling, the rationale being to maximise early exposure to the minority language (Genesee 1987). This practice consistently produces high levels of reading skill in both languages (Genesse 1987; Lambert et al. 1993). The practice is consistent with the 'interdependence principle' (Cummins 2012), that is the idea that reading skills acquired in the second language will transfer readily to first. Exposure to reading in one language develops a basis, termed 'common underlying proficiency', that can be applied to reading in another language. However, there are important differences between the Canadian and Irish immersion experiences. As noted by Harris and Cummins (2013), the attrition rate is high in Canada, and immersion tends to occur in streams rather than as whole school models. This means that a child can switch streams, if they wish to do so. In Ireland, the decision to attend an Irish-medium school is a significant one and it is not a simple matter to change schools if immersion proves problematic for a child.

The situation in Wales is more similar to Ireland, in that immersion tends to be school-wide. However, the language support outside school is far stronger in Welsh-speaking regions compared to in Ireland's Gaeltacht regions. Generally good outcomes are reported for children learning to read in Welsh and English. In one recent study of Welsh primary school children, Rhys and Thomas (2013) compared children attending Welsh-medium schools from different language backgrounds (English at home, Welsh at home, both languages at home, English only). They found that all groups performed within the expected range on English reading, with no differences between the L1 English bilingual and the monolingual English group. However, in contrast to other studies (e.g. Gathercole and Thomas 2009), the L1 Welsh bilinguals and simultaneous Welsh–English bilinguals were behind their L1 English bilingual peers on English receptive vocabulary and reading tasks. This study suggests that bilingual attainment can be complex and challenging for children in strong Welsh-speaking regions.

There is stronger support for the minority language in other countries; Irish occupies a more fragile position in Ireland. Ó Laoire (2005) noted some key differences between immersion in Irish and in other bilingual contexts that lead to particular challenges:

1. The variation in levels of Irish language ability in Irish-immersion children, due to socio-economic, socio-linguistic and educational factors;
2. The variation in quality of spoken Irish in all-Irish children;
3. The tendency for English to be introduced early in all-Irish schools and the sequencing of early reading in Irish and English.

This paper focuses on the latter issue: the sequencing of early reading in Irish and English. Currently in Ireland, there is no consensus on best practice, and sequencing – the order in which Irish and English reading instruction occurs – differs from school to school (see Harris and Cummins [2013] for a thorough overview of the key issues). Research is therefore required to determine how reading instruction might best be structured in order to facilitate biliteracy.

One recent cross-sectional study compared the Irish and English reading skills of children attending Irish-medium, English-medium and Gaeltacht schools (Parsons and Lyddy 2009c). Children completed measures of word reading, non-word reading and vocabulary, in both languages. Children attending Irish-medium schools (immersion and Gaeltacht) performed significantly better on the Irish tasks than the English-medium schooled children across all year groups. There were early differences in the performances of children attending Irish-medium schools who were instructed first on Irish reading compared to those introduced to English first, but these differences resolved quickly. Across the Irish-schooled groups, advantages in Irish reading were observed. These findings suggest that the sequence in which reading is formally introduced is not critical to later L1 reading ability.

However, as a cross-sectional study, the possibility that individual differences affected results cannot be excluded. The current study sought to build on these findings using a longitudinal design. The current study investigated the development of reading in the Irish and English languages across three time points. The cohort of pupils in Senior infants class (Time 1: age 5 years) from the Parsons and Lyddy (2009a) study were retested at two further times points: Time 2 at First class (age 6 years) and Time 3 at Second class (age 7 years). These three year groups, Senior infants, First class and Second class (second, third and fourth years of schooling), were identified as particularly salient benchmarks in Irish primary school children's reading development based on a number of considerations. Senior infants is when formal reading should commence, according to The Irish Revised Primary School Curriculum (1999). Second class is the year in which children in other immersion contexts typically 'catch up' with their peers in conventional programmes on measures of first-language reading skill (Genesee [1978] but see also Rhys and Thomas 2013; Lambert and Tucker 1972; Swain and Lapkin 1982). Furthermore, children in conventional English-medium schools in Ireland are introduced to Irish reading at this point, thereby providing an interesting comparison between school types.

In the present study, both word and non-word reading in Irish and in English were measured. A measure of vocabulary was also included, as it correlates strongly with reading (e.g. Rhys and Thomas 2013). It was predicted that, as in the Parsons and Lyddy (2009c) study, early differences in English reading would be diminished by the second and third time points, while advantages on the Irish tasks would be seen in the children schooled through Irish. A second prediction was that performance on the English language tasks would be higher than on the Irish tasks, for all pupils, given the dominance of English in Ireland.

Methods

Participants

Participants in this study were the youngest children who participated in the Parsons and Lyddy (2009c) cross-sectional study. These children attended one of four school types in Galway in the west of Ireland: an Irish-medium school introducing ERF, an Irish-medium

school introducing IRF, a Gaeltacht school (also IRF) and an English-medium school (ERF). Information about the sequencing practices of the schools was obtained from the school principal.

Children were first assessed at Senior infants ($N = 94$, mean age of 5.9 years; standard deviation [SD] = 0.43), again in First class ($N = 84$, $M = 6.73$; SD = 0.44) and finally a year later in Second class ($N = 84$). Ten of the pupils tested at Time 1 (original senior infants group) were not available for testing at Times 2 and 3. Data reported here are from the 84 children tested at all three time points. The number of boys and girls was similar in each condition. The majority of children in the Gaeltacht school reported speaking only Irish or more Irish than English at home (57%), 14% reported an equal balance and a minority reported more English than Irish (10%) or English only (19%). The children's reported home language use was confirmed by their teacher. From the IRF and the English-medium school, all children reported speaking only English at home. From the ERF, two children reported speaking English and Irish home equally at home.

The timing of the introduction of reading in the two languages is shown in Table 1. As discussed in Parsons and Lyddy (2009a, 2009b), schools were selected within the Galway region for several reasons. The area provides a useful contrast of reading instruction practices across Irish-medium, Gaeltacht and English-medium schools, within one county, administered by the same local educational authorities, with similar curricula and teaching methods. The region has the highest number of primary school children attending Gaeltacht schools in the Republic of Ireland (Mac Donnacha et al. 2005) and also has a number of demographically similar Irish-medium and English-medium schools outside of the Gaeltacht regions.

The Irish literacy programme for senior infants used by the Gaeltacht and the two Irish-medium schools was the 'An Séideán Sí' course (An Gúm 2003), which is specifically aimed at Irish-medium and Gaeltacht schools. The English-medium school used the series Bun go Barr, which is widely used in English-medium schools and follows the Revised Primary School Curriculum themes. For English literacy, all four schools used a mixed method of instruction for English reading (phonics and whole word strategies). In the English-medium school, children were formally introduced to reading in English in Senior infants. Reading instruction in Irish commenced in Second class and emphasised whole word reading. Similar textbooks were employed in all schools for English reading (Starways, Jolly Phonics and Letterland).

Measures

Non-reading and word reading measures were used to assess children's reading attainment and simple word decoding skills, respectively. Children were tested on four tasks: an Irish real-word reading task, an English real-word reading task, an Irish-based

Table 1. Sequencing of reading instruction across the four school types.

	English reading	Irish reading
Irish medium (ERF)	Senior infants (second year of schooling; 5–6 years)	Early first class (third year of schooling, 6–7 years)
Irish medium (IRF)	End of senior infants	Early senior infants
Gaeltacht	End of senior infants	Early senior infants
English medium	Senior infants	Second class

non-word reading task and an English-based non-word reading task. In addition, a vocabulary measure was used for the two languages. All tasks reported here were initially used in the cross-sectional study (Parsons and Lyddy 2009c).

Non-word reading tasks

This task was used to examine simple decoding skills in the two languages. The Irish and English non-word reading tasks consisted of 30 items in each language presented individually on a computer screen. The English non-word reading task was taken from Seymour, Aro, and Erskine (2003). The Irish non-word reading task was constructed by sampling frequent grapheme–phoneme correspondences in the Irish language. Two sets of non-words were constructed for each language; one comprised 15 monosyllables using the structures CV, VC and CVC, and the other of 15 bisyllables using the structures VCV, CVCV and VCVC (see Parsons and Lyddy 2009a). The Irish version of this task was constructed by sampling frequent grapheme–phoneme correspondences in the Irish language, using the EasyReader (Version 1.1, 2003) Irish language software, which provides useful information regarding the occurrence of particular letter strings in Irish words. Features specific to the Irish language such as the vowel length marker (indicating a long vowel sound, e.g. 'á') were included. Each non-word list conformed to the phonotactic rules of the relevant language. The Irish and English task versions were matched with regards to number of letters, phonemes and syllables. The order of the non-words was randomised across the test lists.

Word reading

The English and Irish single word reading tasks presented 50 words individually on a computer screen. The English words were taken from a number of studies of literacy in children similar to the age range tested here (Hanley et al. 2004; Masterson, Laxon, and Stuart 1992; Patel, Snowling, and De Jong 2004; Spencer and Hanley 2004) and additional (more difficult, less frequent) words were selected using Kučera and Francis (1967) written frequency ratings. In order to match the English and Irish tasks on difficulty, the Irish set used translations of the English words (see Parsons and Lyddy 2009c). This method of matching items across languages has been used in a number of studies in the Welsh–English context (e.g. Hanley et al. 2004; Spencer and Hanley 2003, 2004; see Ellis et al. [2004] for a discussion of the merits of this approach). The English word set comprised 33 monosyllabic words, 14 bisyllabic words, two trisyllabic words and one quadrasyllabic word. The Irish word list contained 33 monosyllabic words, 14 bisyllabic words and three trisyllabic words. No significant difference was found between the number of syllables in the English (M = 1.42, SD = 6.7) and Irish word sets (M = 1.4, SD= 6 .1, $t(49) = 0.44$, $p = .66$; see Parsons and Lyddy 2009c).

Participants were required to read up to 50 words in each language. Word order on the Irish list was the same as the order of their translations on the English list. The words were placed in sequential order of increasing difficulty, by frequency of occurrence. This ensured that, at the first time point, the young children were familiar with some of the initial words on the list and could attempt the task.

Vocabulary

In the absence of standardised instruments to test Irish vocabulary, a measure of receptive vocabulary was developed (see Gathercole et al. [2013] for discussion of bilingual measurement issues). Each child had to choose which of four pictures (full-colour simple line drawings) shown on a computer screen best corresponded with a spoken word. Thirty English words and 30 Irish words were presented to each child. As described in Parsons and Lyddy (2009c), 30 English words were selected using age of acquisition ratings (Gilhooly and Logie 1980) and frequencies for written words (Kučera and Francis 1967). The English words were nouns with high ratings on scales of familiarity, concreteness and imageability (further details on word selection are given in Parsons and Lyddy [2009c]).

The Irish vocabulary items were translations of the English words. A large set of English words was translated into Irish, with items of similar word length and number of syllables selected to ensure comparable difficulty. There were no significant differences in the number of letters or syllables between the Irish and the English word sets. Words were presented in the same order on both (Irish and English) lists, with words presented by increasing difficulty. The overall aim in designing the Irish and English vocabulary measures was to implement tests of similar difficulty in the two languages.

Procedure

The University Ethics Committee granted ethical approval for the study prior to commencement. Written parental consent was obtained before testing each child, and children were invited to participate during class. Test instructions were provided in Irish for the IRF, ERF and Gaeltacht school children and in English for the English-medium school children. Each child was tested individually at the back of the classroom. The order of the administration of the English and Irish tasks was counterbalanced across participants. Within languages, the tasks were administered in a fixed order in a testing session lasting approximately 30 minutes, with the non-word reading task presented first. For this task, the participant was asked to sound out the letter string as best he/she could and all plausible pronunciations were accepted as correct; for example, for the item ‘bina’ from the English test, both /i/ and /I/ pronunciations of the vowel sound were accepted. However, in the Irish task, the appropriate vowel length (as indicated by the diacritic vowel length marker) was required for a correct answer. The maximum score for both the English and Irish task versions was 30 and children attempted all items.

The maximum score for word reading was 50. The word reading tasks were discontinued if a child gave five incorrect responses consecutively. Self-corrections were considered as correct responses. The children were encouraged to attempt to answer even if they were unsure.

The vocabulary task was presented last. Participants were asked to choose a picture that best represented the meaning of a word spoken by the researcher. The child selected one of four pictures (full-colour simple line drawings) presented on a computer screen. Four practice trials with feedback were given at the start of the task to ensure that the children understood the instructions. The maximum obtainable score for the vocabulary tasks was 30 in each language. Participants were allowed a short break between the two language tests.

Results

Data consisted of total correct scores for each child on each task at each of the three testing time points. A series of mixed analysis of variance (ANOVAs) were used, with two within-subjects variables – testing time (Time 1, Time 2 and and Time 3) and language (Irish and English), and one between-subjects variable (school type: IRF, ERF, Gaeltacht and English-medium).

Non-word reading

Average scores for the four school groups on the two non-word reading tasks across the three testing times are summarised in Figure 1. Children's performance improved over the three times. However, the rate of improvement for each class group varied across school type and by language.

The main effect of language was significant, $F(1, 80) = 178.17$, $p < .0001$, $\eta p^2 = .47$. Mean scores were found to be lower across the four school groups for the Irish task compared with the English task. A three-way ANOVA showed a significant Language × School-type interaction, $F(3, 80) = 4.38$, $p < .0001$, $\eta p^2 = .51$, a significant Time × Language interaction, $F(2, 79) = 330.8$, $p < .0001$, $\eta p^2 = .8$, and a significant Language × School type × Time interaction, $F(6, 158) = 37.71$, $p < .0001$, $\eta p^2 = .29$.

Children taught through Irish had higher scores on the Irish task than the English-medium children, and all performed better on the English task.

Irish non-word reading

Overall, scores on the Irish non-word reading were lower than English non-word reading.

For the Irish non-word reading task, the effect of school type was significant at Time 1, $F(3, 80) = 7.93$, $p < .0001$, $\eta p^2 = .32$; Time 2, $F(3, 80) = 10.65$, $p < .0001$, $\eta p^2 = .42$; and Time 3, $F(3, 80) = 20.87$, $p < .0001$, $\eta p^2 = .45$. At Time 1, the IRF children scored significantly higher than the ERF children (Tukey's test, $p = .02$), with both groups achieving higher scores than Gaeltacht and English-medium children. The English-medium children scored higher than the Gaeltacht children ($p < .05$). At Time 2, the ERF children scored similarly to the IRF children ($p = .99$) while the Gaeltacht and English-medium children scored below the ERF and IRF children (p values <.001). At Time 3, the Gaeltacht children scored similarly to the ERF ($p = .99$) and IRF children ($p = .71$), while the children from the English-medium school scored below the other groups ($p < .01$).

English non-word reading

On the English non-word reading task, there was a significant effect of School type at Time 1, $F(3, 80) = 16.31$, $p < .0001$, $\eta p^2 = .38$, and Time 2, $F(3, 80) = 22.96$, $p < .0001$, $\eta p^2 = .46$. At Time 1, post hoc (Tukey) comparisons indicated that IRF, ERF and English-medium children scored at a similar level, and all groups performed significantly than the Gaeltacht children ($p < .01$). By Time 2, the IRF children scored similarly to the English-medium and ERF ($p > .05$), but the Gaeltacht children had significantly lower scores (all p *value*s <.001). At Time 3, there were no significant differences between the four school groups on the English non-word reading task, $F(3, 80) = 3.12$, $p = .18$.

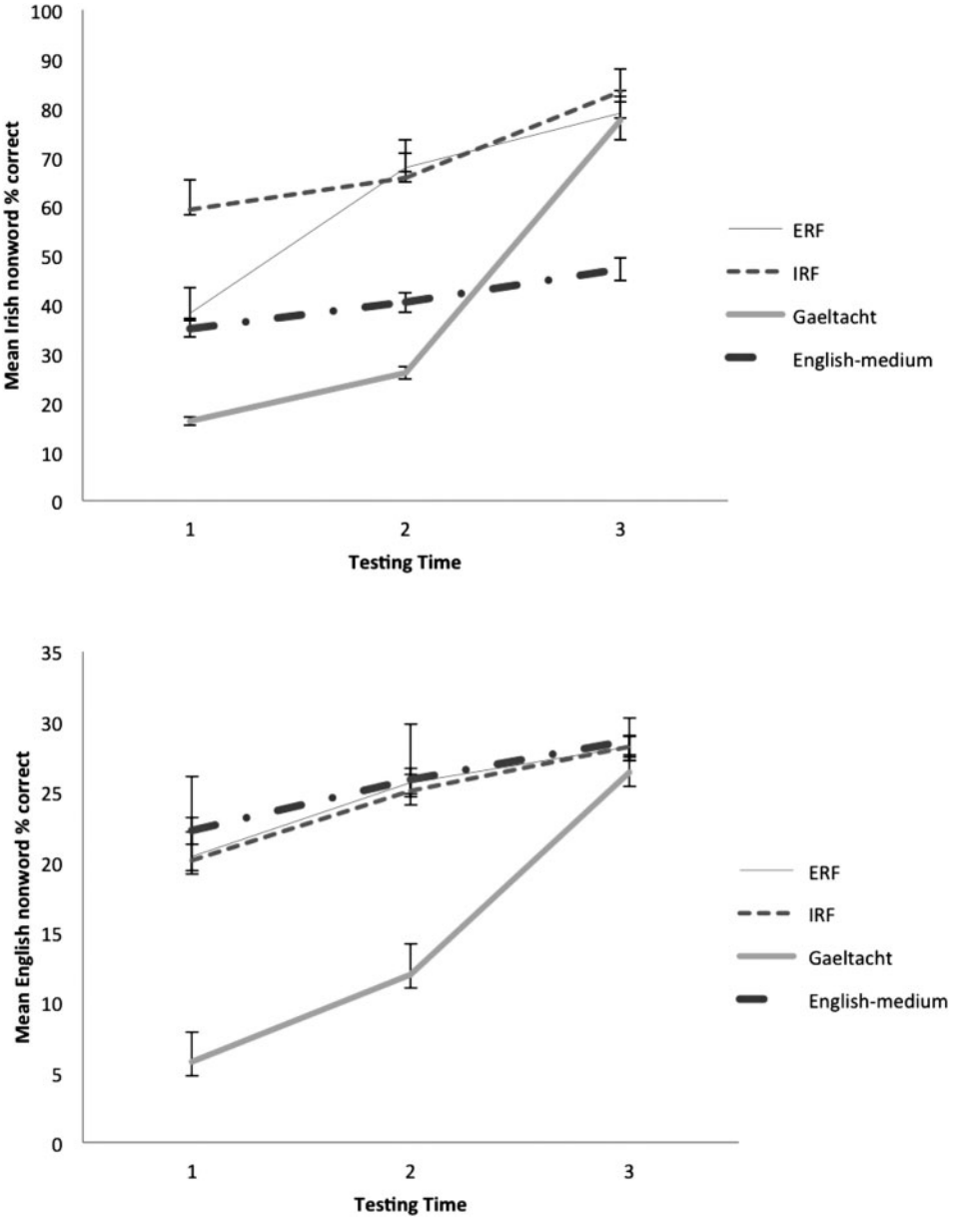

Figure 1. Mean percentage scores on (a) the Irish and (b) the English non-word reading tasks for the four groups across the three time periods.

Word reading

The mean word reading scores are presented in Figure 2. As in the non-word reading task, mean scores improved by the third time of testing, but the rate of improvement for the class groups varied across the school types and also for the Irish and English tasks. The main effect of Language was significant, $F(1, 80) = 484.04$, $p < .0001$, $\eta p^2 = .51$, with better performance overall on English reading across the four school groups. The main effect of Time was also significant, $F(1, 79) = 247.63$, $p < .0001$, $\eta p^2 = .17$, with

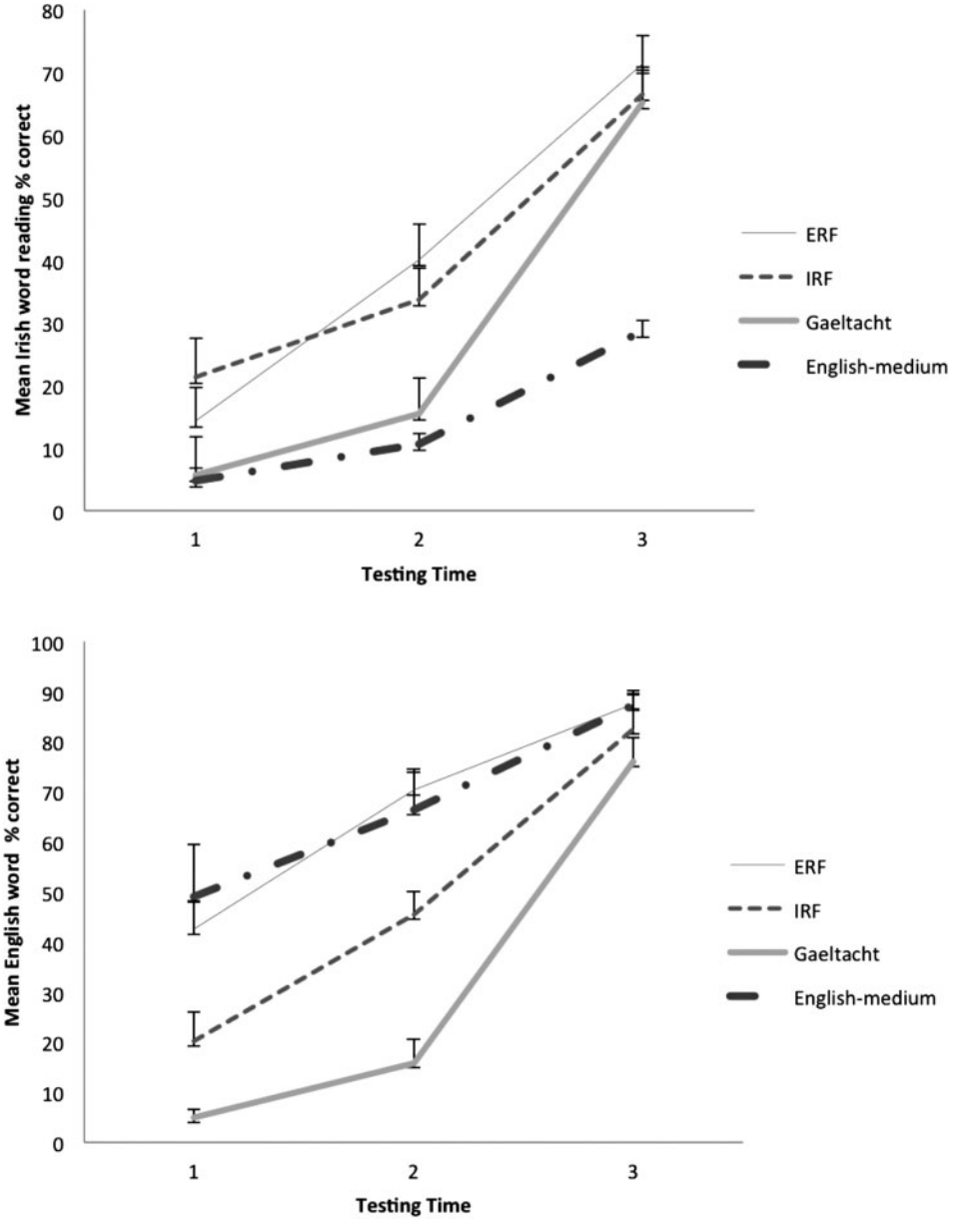

Figure 2. Mean percentage scores on (a) the Irish and (b) the English word reading tasks for the four target groups across the three time periods.

improvement from Time 1 to 2, $F(1, 80) = 141.99$, $p < .01$, and Time 2 to 3, $F(1, 80) = 427.38$, $p < .01$. There was a significant Language × School type interaction, $F(3, 80) = 16.98$, $p < .0001$, $\eta p^2 = .51$, a significant Time × Language interaction, $F(2, 79) = 647.66$, $p < .0001$, $\eta p^2 = .92$, and a significant Language × School type × Time interaction, $F(6, 158) = 43.56$, $p < .0001$, $\eta p^2 = .71$.

Irish word reading

On the Irish word reading task, differences by School were evident at Time 1, $F(3, 80) = 7.93$ $p < .0001$, $\eta p^2 = .23$, Time 2, $F(3, 80) = 10.65$, $p < .0001$, $\eta p^2 = .29$, and Time 3, $F(3, 80) = 20.87$, $p < .0001$, $\eta p^2 = .44$. At Times 1 and 2, the Irish-medium ERF and IRF children performed at an equivalent level and both performed significantly better than the Gaeltacht and English-medium groups ($p < .01$). The Gaeltacht and English-medium school children performed similarly at these two test times ($p = .47$). At Time 3, the Gaeltacht children scored similarly to the Irish-medium ERF and IRF groups, while the children from the English-medium school scored significantly below the other groups ($p < .01$). This mirrors the pattern found for the Irish non-word reading task: children taught through the medium of Irish (ERF, IRF and Gaeltacht) showed an advantage for Irish word reading.

English word reading

On the English word reading task, there was a significant effect of School type at Time 1, $F(3, 80) = 19.4$, $p < .0001$, $\eta p^2 = .42$; Time 2, $F(3, 80) = 26.51$, $p < .0001$, $\eta p^2 = .5$; and to a lesser degree, Time 3, $F(3, 80) = 3.12$, $p = .03$, $\eta p^2 = .1$. At Times 1 and 2, post hoc comparisons (Tukey) indicated that the Irish-medium ERF and English-medium children scored at a similar level, and both groups performed significantly better than the IRF and Gaeltacht children ($p < .01$). At Time 3, the Gaeltacht children scored significantly below the English-medium children ($p = .04$), but were similar to the ERF ($p = .06$) and IRF children ($p = .45$). No other differences between the groups emerged.

Vocabulary

Figure 3 summarises the performance of the four school groups on the two vocabulary tasks across the three testing times. The main effect of Language was significant, $F(1, 80) = 4.67$, $p < .01$, $\eta p^2 = .83$. Generally, children did better on the English vocabulary task compared with the Irish task. There was also a significant Language × School type interaction, $F(3, 80) = 13.62$, $p < .0001$, $\eta p^2 = .44$. Children taught through Irish showed an advantage on the Irish task, with few differences on the English task.

Irish vocabulary

For the Irish vocabulary task, the main effect of School type was significant at Time 1, $F(3, 80) = 64.78$, $p < .0001$, $\eta p^2 = .71$, Time 2, $F(3, 80) = 152.86$, $p < .0001$, $\eta p^2 = .85$, and Time 3, $F(3, 80) = 141.86$, $p < .0001$, $\eta p^2 = .81$. Across all three time points, the English-medium school children scored below the other groups ($p < .01$). Until Time 3, the Gaeltacht children demonstrated a significant advantage over the other groups on this measure ($p < .01$). At Time 3, children from both the Irish-medium ERF and IRF groups achieved similar mean scores to the Gaeltacht children. All three Irish-medium groups scored significantly better than the English-medium group.

English vocabulary

On the English vocabulary task, the four school groups performed similarly at Time 1, $F(3,80) = 2.78$, $p = .07$, and Time 3, $F(3. 80) = .18$, $p = .91$. A small, but significant,

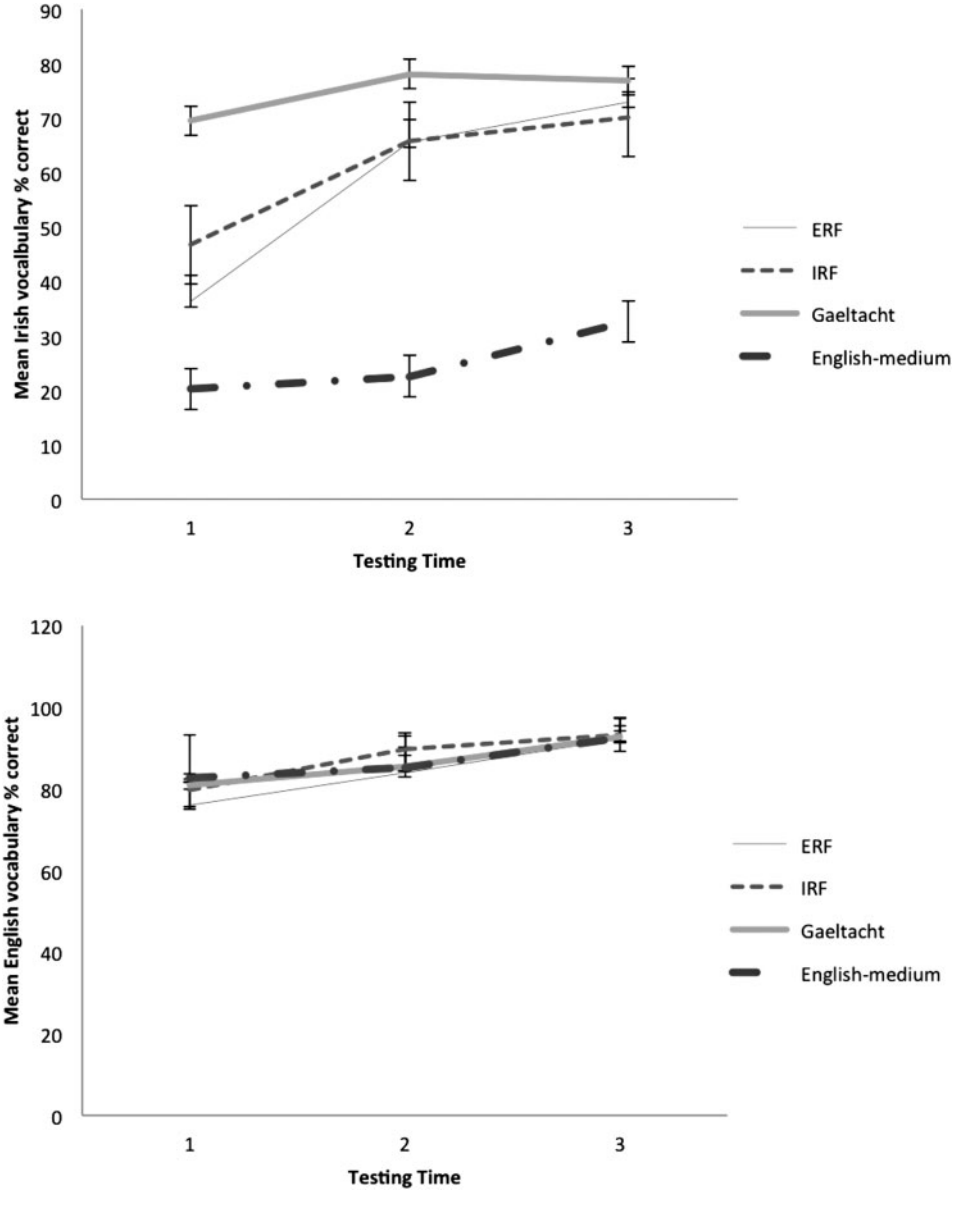

Figure 3. Mean percentage scores on (a) the Irish and (b) the English vocabulary tasks for the four target groups across the three time periods.

main effect for School type was found at Time 2, $F(3.\ 80) = 3.87$, $p = .01$, $\eta p^2 = .13$. All groups were scoring at around 80% accuracy. Post hoc comparisons indicated that the Irish-medium ERF children scored significantly below the IRF children ($p < .05$). No other group differences reached significance.

By Time 3, all four groups showed similar performance on the English vocabulary task.

Discussion

Across the measures of Irish reading skill at the final testing point, children attending Irish-medium schools (ERF, IRF and Gaeltacht) demonstrated significant advantages over children attending the English-medium school. The English-medium children understood fewer words on the Irish vocabulary measure compared to the Irish-medium groups. These Irish language task advantages for the Irish-medium children were achieved without any measurable accuracy score differences on the English reading tasks. By the fourth year of schooling, there were no significant differences between Irish-medium children and their English-medium counterparts on all the English language measures, with one exception: the Gaeltacht group scored below the English-medium children only on the English word reading. The performance of this group had, however, shown clear improvement across the three testing points. These findings were broadly in line with the study hypotheses.

Overall, children's performance was better on the English versions of the tasks than the Irish versions. This is not surprising given the dominance of the English language, even for those schooled within the Gaeltacht. In immersion schools in other countries, initial reading instruction generally occurs in the target language (often the L2). However, in Ireland, there is a diverse range of practices in operation in Irish-medium schools. The available figures suggest that a majority of Irish-medium schools commence with Irish reading initially (Ní Bhaoill and Ó Duibhir 2004), but a sizeable number introduce English reading initially. In the current study, children in ERF schools, at first and second time points, had significantly higher scores on both the English non-word and word reading tasks than the IRF children. By Time 2, however, the IRF children had made up this initial difference on both tasks. In contrast, at Time 1, the IRF children scored significantly higher than the other children in the Irish non-word reading task, although both the ERF and IRF children scored significantly higher than the other groups on the Irish real-word reading task. However, by Time 2, the ERF children performed similarly to the IRF children on the Irish non-word reading task. This further supports the view that the language in which reading is introduced is not critical to the later development of reading competency in either L1 or L2 (Cummins, Hurley, and Tinajero 2001; Ewart and Straw 2001; Parsons and Lyddy 2009c).

In the current study, the Gaeltacht children had lower scores on a number of the English measures at the earlier testing points compared with the other school groups. However, they were performing similarly to the other school groups on all measures at the final testing time, with the exception of the English-medium children on English word reading task. Looking at the Irish language measures, the Gaeltacht children showed a substantial advantage on the vocabulary measure at the first and second testing times. However, they performed below the Irish-medium children on the word reading measures. This perhaps reflects the early emphasis on oral language skills in the Gaeltacht school, but further work is required to determine the reason for such a difference. By the final time point, the Gaeltacht children and the Irish-medium children all performed similarly on the Irish word and non-word reading tasks. The Irish-medium children also performed similarly to the Gaeltacht children on the Irish vocabulary measure.

Overall, the present data correspond well with studies of immersion conducted in Ireland and in other countries. The second-language reading skill advantages found here, and the absence of a 'cost' to first-language reading skills, concur with results from Canadian immersion (e.g. Curtain and Pesola 1994; Day and Shapson 1989; Swain 1996;

Swain and Lapkin 2005), Welsh immersion (e.g. Rhys and Thomas 2013) and previous national surveys of achievement in Irish (e.g. Harris et al. 2006; Murtagh 2007; Shiel et al. 2011). The Irish vocabulary scores of the Gaeltacht group were significantly higher than all other class groups at the first testing time, and their advantage lasted until the second testing time. Furthermore, the Irish-medium immersion pupils were level with the Gaeltacht children at the third time point. This is in line with evaluations of French programmes, which have found that immersion pupils can score at levels comparable to those of native speakers on some measures of receptive language skills (Harley et al. 1990).

These findings are also of interest in light of recent arguments for a more integrated PSC, that would emphasis cross-language skill transfer (Ó Duibhir and Cummins 2012). Within this approach, there is a general emphasis on cross-linguistic transfer, rather than a prescription of specific reading sequencing practicing. A challenge for curriculum design in Ireland is that languages are encountered in a variety of contexts in Irish primary schools. Ó Duibhir and Cummins (2012) suggest that it would be more helpful to define general language learning pathways that individual learners can traverse at different rates according to their contact with languages both within the school and outside of it, rather than to specify different curricula. The present study suggests that in the schools tested, reading outcomes were similar despite differences in language instruction approaches.

While the current study was conducted in a region of linguistic interest, conclusions are somewhat constrained by its quasi-experimental design. Each school type is represented by a small sample, each drawn from one school only. As such, children were taught by different teachers, and in different classrooms. It is possible that some of the results arose from effects of school or class group rather than as a result of the school type. Nonetheless, the longitudinal nature of the study is a strength. Furthermore, the schools were all administered by one educational authority, followed the same curriculum and utilised the same textbooks. The home language background of the children was not controlled for and the groups were not matched for non-verbal ability. The test of vocabulary was limited to a receptive measure, consisting of translated items. Future studies might include productive vocabulary, standardised norm-referenced English vocabulary measures and measures of more complex reading skill (e.g. reading comprehension). The use of norm-referenced English measures would allow for comparison with pupil performance from other countries.

Another issue in understanding school context effects on reading and language outcomes in Ireland is related to socio-economic status (SES). It has been previously reported that Irish-medium schools in English-speaking regions are often of higher SES than English-medium or Gaeltacht schools (e.g. Harris et al. 2006). There is also robust evidence for an association between SES and reading outcomes (Aikens and Barbarin 2008; Netten et al. 2014; Noble, Farah, and McCandliss 2006; Shera 2014). In Ireland, studies of English reading in primary schools confirm that as SES increases, so too does achievement in English reading (Eivers et al. 2005, 2010). In the current study, no specific measure of school SES was obtained. Furthermore, it is typical that parents must opt to choose to send their children to Irish-medium schools, whereas this is not the case for English-medium schools. Parental variables have a strong impact on children's reading and language outcomes (Parsons et al. 2010, 2013; Sénéchal and LeFevre 2002; Xu et al. 2010). Future studies might aim to control for SES, and related factors, such as parental involvement, in examining reading outcomes.

In conclusion, the current longitudinal results suggest that the sequence in which reading is introduced is not crucial to later biliteracy, consistent with a previous

cross-sectional study (Parsons and Lyddy 2009c). As in other immersion educational contexts, children in the Irish immersion schools performed comparably to the children in the English-medium school in their native language (English) after 2/3 years of formal instruction. The children in the Irish immersion schools also demonstrated consistent advantages across all the Irish language tasks when compared to the children taught through English. These findings suggest that diversity in the sequencing of the introduction of reading does not create measurable differences in English reading in the groups tested here. As (Harris and Cummins 2013, 91) note:

> The fact that practice relating to the sequencing of early reading differs from schools to school (ERF or IRF) is not, in itself, evidence of a departure from optimum strategy either at the school level or nationally. *Which approach to sequencing early reading is correct?* may simply be the wrong question. There may be no one best way, no one correct strategy relating to early reading that is appropriate for all Irish-immersion schools.

It may also be that individual child-level variables are important in determining the first language of reading instruction. Additional research, with larger samples, is required to determine *if* there is a most appropriate reading sequence in the Irish-medium context.

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References

Aikens, N. L., and O. Barbarin. 2008. "Socioeconomic Differences in Reading Trajectories: The Contribution of Family, Neighborhood, and School Contexts." *Journal of Educational Psychology* 100 (2): 235–251. doi:10.1037/0022-0663.100.2.235.

An Gúm. 2003. *Séideán Sí: Cúrsa Comhthaite Gaeilge* [Séideán Sí: Comprehensive Gaelic Course]. Dublin: Foras na Gaeilge.

Berens, M. S., I. Kovelman, and L. A. Petitto. 2013. "Should Bilingual Children Learn Reading in Two Languages at the Same Time or in Sequence?" *Bilingual Research Journal* 36 (1): 35–60. doi:10.1080/15235882.2013.779618.

Cummins, J. 2012. "Linguistic Interdependence and the Educational Development of Bilingual Children." *Review of Educational Research* 82 (3): 222–251.

Cummins, J., S. R. Hurley, and J. V. Tinajero. 2001. "Assessment and Intervention with Culturally and Linguistically Diverse Learners." In *Literacy Assessment of Second Language Learners*, edited by Josefina Villamil Tinajero and Sandra Rollins Hurley, 115–129. Boston: Allyn & Bacon.

Curtain, H., and C. Pesola. 1994. *Languages and Children: Making the Match*. 2nd ed. White Plains, NY: Longmam.

Day, E., and S. Shapson. 1989. "Provincial Assessment of French Immersion Programmes in British Columbia." *Evaluation and Research in Education* 3 (1): 7–23. doi:10.1080/09500798909533252.

Department of Education and Science, Ireland. 2007. *Statement of Strategy: 2005–2007*. Dublin: Department of Education and Science.

Department of Education and Science, Ireland. 2013. *Review of Education in the Gaeltacht*. Dublin: Department of Education and Science.

Eivers, E., S. Close, G. Shiel, D. Millar, A. Clerkin, L. Gilleece, and J. Kiniry. 2010. *The 2009 National Assessments of Mathematics and English Reading*. Dublin: Educational Research Centre.

Eivers, E., G. Shiel, R. Perkins, and J. Cosgrove. 2005. *Succeeding in Reading. The 2004 National Assessment of English Reading*. Dublin: Department of Education and Science.

Ellis, N. C., M. Natsume, K. Stavropoulou, L. Hoxhallari, V. H. P. van Daal., N. Polyzoe, M.-L. Tsipa, and M. Petalas. 2004. "The Effects of Orthographic Depth on Learning to Read Alphabetic, Syllabic, and Logographic Scripts." *Reading Research Quaterly* 39 (4): 438–468.

Ewart, G., and S. Straw. 2001. "Literacy Instruction in Two French Immersion Classrooms in Western Canada." *Language, Culture and Curriculum* 14 (2): 197–199.

Gathercole, V. C. M., and E. M. Thomas. 2009. "Bilingual First-language Development: Dominant Language Takeover, Threatened Minority Language Take-up." *Bilingualism: Language and Cognition* 12 (2): 213–237.

Gathercole, V. C. M., E. M. Thomas, E. J. Roberts, C. Hughes, and E. K. Hughes. 2013. "Why Assessment Needs to Take Exposure into Account: Vocabulary and Grammatical Abilities in Bilingual Children." In *Issues in the Assessment of Bilinguals*, edited by Virginia C. Mueller Gathercole, 20–55. Bristol: Multilingual Matters.

Genesee, F. 1978. "Scholastic Effects of French Immersion: An Overview after Ten Years." *Interchange* 9 (4): 20–29. doi:10.1007/BF01189544.

Genesse, F. 1987. *Learning through Two Languages. Studies of Immersion and Bilingual Education*. Cambridge, MA: Newbury House.

Gilhooly, K. J., and R. H. Logie. 1980. "Age-of-acquisition, Imagery, Concreteness, Familiarity, and Ambiguity Measures for 1,944 Words." *Behavior Research Methods & Instrumentation* 12: 395–427. doi:10.3758/BF03201693.

Government of Ireland. 2012. *This Is Ireland: Highlights from Census 2011, Part 1*. Edited by Central Statistics Office. Dublin: Stationary Office.

Hanley, J. R., J. Masterson, L. H. Spencer, and D. Evans. 2004. "How Long Do the Advantages of Learning to Read a Transparent Orthography Last? An Investigation of the Reading Skills and Reading Impairment of Welsh Children at 10 Years of Age." *The Quarterly Journal of Experimental Psychology Section A* 57: 1393–1410. doi:10.1080/02724980343000819.

Harley, B., P. Allen, J. Cummins, and M. Swain. 1990. *The Development of Second Language Proficiency.* Cambridge, UK: Cambridge University Press. doi:10.1017/CBO9781139524568.

Harris, J. 1984. *Spoken Irish in Primary Schools*. Dublin: Institiúid Teangeolaíochta Éireann.

Harris, J., and J. Cummins. 2013. "Issues in All-Irish Education: Strengthening the Case for Comparative Immersion." In *Current Multilingualism: A New Linguistic Dispensation*, edited by J. A. F. D. Singleton, L. Aronin, and M. Ó Laoire, 69–98. Berlin: Walter de Gruyter.

Harris, J., P. Forde, P. Archer, S. Nic Fhearaile, and M. O'Gorman. 2006. *Irish in Primary Schools: Long-term National Trends in Achievement*. Dublin: Department of Education and Science. The Stationary Office.

Hickey, T. M. 2007. "Fluency in Reading Irish as L1 or L2: Promoting High Frequency Word Recognition in Emergent Readers." *International Journal of Bilingual Education and Bilingualism* 10: 471–493. doi:10.2167/beb455.0.

Hickey, T., and N. Stenson. 2011. "Irish Orthography: What Do Teachers and Learners Need to Know About It, and Why?" *Language, Culture and Curriculum* 24 (1): 23–46. doi:10.1080/07908318.2010.527347.

Kenner, C. 2005. "Bilingual Families as Literacy Eco-systems." *Early Years* 25 (3): 283–298. doi:10.1080/09575140500251897.

Kučera, H., and W. Francis. 1967. *Computational analysis of present-day American English.* Providence: Brown University Press.

Lambert, W. E., F. Genesee, N. Holobow, and L. Chartrand. 1993. "Bilingual Education for Majority English-speaking Children." *European Journal of Psychology of Education* 8 (1): 3–22. doi:10.1007/BF03172860.

Lambert, W. E., and R. G. Tucker. 1972. *Bilingual Education of Children. The St. Lambert Experiment.* Rowley, MA: Newbury House.

Lyddy, F. 2012. "What Can Homograph Interpretation Tell Us about Language Status in Irish/English Bilinguals?" *International Journal of Applied Linguistics* 22 (1): 105–123. doi:10.1111/j.1473-4192.2011.00304.x.

Mac Donnacha, S., F. Ní Chualáin, A. Ní Shéaghdha, and T. Ní Mhainín. 2005. *Staid Reatha na Scoileanna Gaeltachta/Current state of Galtacht schools*. Dublin: An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta.

Masterson, J., V. Laxon, and M. Stuart. 1992. "Beginning Reading with Phonology." *British Journal of Psychology* 83 (1): 1–12. doi:10.1111/j.2044-8295.1992.tb02420.x.

Montanari, S. 2014. "A Case Study of Bi-literacy Development among Children Enrolled in an Italian–English Dual Language Program in Southern California." *International Journal of Bilingual Education and Bilingualism* 17: 509–525. doi:10.1080/13670050.2013.833892.

Murtagh, L. 2007. "Out-of-school Use of Irish, Motivation and Proficiency in Immersion and Subject-only Post-primary Programmes." *International Journal of Bilingual Education and Bilingualism* 10: 428–453. doi:10.2167/beb453.0.

Netten, A., H. Luyten, M. Droop, and L. Verhoeven. 2014. "Role of Linguistic and Sociocultural Diversity in Reading Literacy Achievement: A Multilevel Approach." *Journal of Research in Reading*. doi:10.1111/1467-9817.12032.

Ní Bhaoill, M., and P. Ó Duibhir. 2004. *Emergent Literacy in Gaeltacht and All-Irish Schools.* Dublin: An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta.

Ní Shéaghdha, A. 2010. *Taighde ar Dhea-Chleachtais Bhunscoile i dtaca le Saibhriú/Sealbhú agus Sóisialú Teanga do Dhaltaí arb í an Ghaeilge a gCéad Teanga.* Dublin: An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta.

Noble, K. G., M. J. Farah, and B. D. McCandliss. 2006. "Socioeconomic Background Modulates Cognition–Achievement Relationships in Reading." *Cognitive Development* 21 (3): 349–368. doi:10.1016/j.cogdev.2006.01.007.

Ó Duibhir, P., and J. Cummins. 2012. *Towards an Integrated Language Curriculum in Primary Education* (*Children Aged 3–12 Years*). Dublin: National Council for Curriculum and Assessment.

Ó Giollagáin, C. 2014. "Unfirm Ground: A Re-assessment of Language Policy in Ireland since Independence." *Language Problems and Language Planning* 38 (1): 19–41.

Ó Giollagáin, C., S. Mac Donnacha, F. Ní Chualáin, A. Ní Shéaghdha, and M. O'Brien. 2007. *Comprehensive Linguistic Study of the Use of Irish in the Gaeltacht/Staidéar Cuimsitheach Teangeolaíoch ar Úsáid na Gaeilge sa Ghaeltacht*. The Department of Community, Rural and Gaeltacht Affairs. Dublin: Stationery Office.

Ó Laoire, M. 2005. "An Overview of Bilingualism and Immersion Education in Ireland: Complexity and Change." In *Bilingualism and Education: From Family to School*, edited by Rodríguez-Yáñez, Xoán Paulo, Lorenzo Suárez, Anxo M. and Ramallo Fernando, 275–282. Munich: Lincom Europa.

Ó Laoire, M., and J. Harris. 2006. *Language and Literacy in Irish-medium Primary Schools: Review of Literature.* Dublin: National Council for Curriculum an Assessment.

Ó Muircheartaigh, J., and T. Hickey. 2008. "Academic Outcome, Anxiety and Attitudes in Early and Late Immersion in Ireland." *International Journal of Bilingual Education and Bilingualism* 11: 558–576. doi:10.1080/13670050802149184.

Ó Riagáin, P. 2001. "Irish Language Production and Reproduction 1981–1996." In *Can Threatened Languages Be Saved?*, edited by Joshua A. Fishman, 195–214. Bristol: Multilingual Matters.

Parsons, C. E., and F. Lyddy. 2009a. "Early Reading Strategies in Irish and English: Evidence from Error Types." *Reading in a Foreign Language* 21 (1): 22–36.

Parsons, C. E., and F. Lyddy. 2009b. *Learning to Read in Irish and English: A Comparison of Children in Irish-medium, Gaeltacht and English-medium Schools in Ireland*. Dublin: An Chomhairle um Oideachas Gaeltachta agus Gaelscolaíochta.

Parsons, C. E., and F. Lyddy. 2009c. "The Sequencing of Formal Reading Instruction: Reading Development in Bilingual and English-medium Schools in Ireland." *International Journal of Bilingual Education and Bilingualism* 12: 493–512. doi:10.1080/13670050802153434.

Parsons, C. E., E. A. Stark, K. S. Young, A. Stein, and M. L. Kringelbach. 2013. "Understanding the Human Parental Brain: A Critical Role of the Orbitofrontal Cortex." *Social Neuroscience* 8: 525–543. doi:10.1080/17470919.2013.842610.

Parsons, C. E., K. S. Young, L. Murray, A. Stein, and M. L. Kringelbach. 2010. "The Functional Neuroanatomy of the Evolving Parent–Infant Relationship." *Progress in Neurobiology* 91: 220–241. doi:10.1016/j.pneurobio.2010.03.001.

Patel, T. K., M. J. Snowling, and P. F. De Jong. 2004. "A Cross-linguistic Comparison of Children Learning to Read in English and Dutch." *Journal of Educational Psychology* 96: 785–797. doi:10.1037/0022-0663.96.4.785.

Rhys, M., and E. M. Thomas. 2013. "Bilingual Welsh–English Children's Acquisition of Vocabulary and Reading: Implications for Bilingual Education." *International Journal of Bilingual Education and Bilingualism* 16: 633–656. doi:10.1080/13670050.2012.706248.

Sénéchal, M., and J. A. LeFevre. 2002. "Parental Involvement in the Development of Children's Reading Skill: A Five-year Longitudinal Study." *Child Development* 73: 445–460.

Seymour, P. H. K., M. Aro, and J. M. Erskine. 2003. "Foundation Literacy Acquisition in European Orthographies." *British Journal of Psychology* 94: 143–174. doi:10.1348/000712603321661859.

Shera, P. 2014. "School Effects, Gender and Socioeconomic Differences in Reading Performance: A Multilevel Analysis." *International Education Studies* 7 (11): 28–39. doi:10.5539/ies.v7n11p28.

Shiel, G., L. Gillece, A. Clerkin, and D. Millar. 2011. *The 2010 National Assessments of English Reading and Mathematics in Irish-medium Schools: Summary Report.* Dublin: Educational Research Centre.

Spencer, L. H., and J. R. Hanley. 2003. "The Effects of Orthographic Consistency on Reading Development and Phonological Awareness: Evidence from Children Learning to Read in Wales." *British Journal of Psychology* 94: 1–28.

Spencer, L. H., and J. R. Hanley. 2004. "Learning a Transparent Orthography at Five Years Old: Reading Development of Children during Their First Year of Formal Reading Instruction in Wales." *Journal of Research in Reading* 27 (1): 1–14. doi:10.1111/j.1467-9817.2004.00210.x.

Swain, M. 1996. "Discovering Successful Second Language Teaching Strategies and Practices: From Programme Evaluation to Classroom Experimentation." *Journal of Multilingual and Multicultural Development* 17 (2–4): 89–104. doi:10.1080/01434639608666261.

Swain, M., and S. Lapkin. 1982. *Evaluating Bilingual Education: A Canadian Case Study.* Clevedon: Multilingual Matters.

Swain, M., and S. Lapkin. 2005. "The Evolving Sociopolitical Context of Immersion Education in Canada: Some Implications for Program Development." *International Journal of Applied Linguistics* 15 (2): 169–186. doi:10.1111/j.1473-4192.2005.00086.x.

Watson, I., and M. N. G. Phádraig. 2011. "Linguistic Elitism: The Advantage of Speaking Irish rather than the Irish-speaker Advantage." *Economic and Social Review* 42: 437–454.

Xu, M., S. N. Kushner Benson, R. Mudrey-Camino, and R. P. Steiner. 2010. "The Relationship between Parental Involvement, Self-regulated Learning, and Reading Achievement of Fifth Graders: A Path Analysis Using the ECLS-K Database." *Social Psychology of Education* 13 (2): 237–269. doi:10.1007/s11218-009-9104-4.