

## What can homograph interpretation tell us about language status in Irish/English bilinguals?

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This study examined how language context affects homograph interpretation by bilingual (Irish/English) adults and children. Participants categorized written words and nonwords as 'Irish', 'English', 'Both' (homographs) or 'Neither'. This task was conducted through Irish or English. The homographs had a higher written frequency in Irish than in English. The results showed children were more likely to interpret the homographs as Irish, regardless of task language, while adults were equally likely to read the words as Irish or English, despite the higher frequency in Irish. Children's identification of Irish words was facilitated when the task was conducted through Irish. These findings reveal the fragile state of written Irish for L1 speakers and point to a need to support L1 Irish speakers in teaching and assessment contexts.

*Keywords:* bilingualism, biliteracy, homographs, minority languages, children

Diese Studie überprüfte den Effekt des Sprachzusammenhangs auf Homografdeutung, für zweisprachige (Irisch/Englisch) Erwachsene und Kinder. Die Teilnehmer mussten Wörter, echte oder fiktive, im Schriftbild als Irisch, Englisch, Beides, oder Keines von beiden bezeichnen. Die Befragung fand auf irisch oder auf englisch statt. Die Homografe waren im Schriftbild häufiger in irischen Texten. Die Ergebnisse zeigten, dass Kinder dazu tendierten, die Homografe eher als Irisch aufzufassen, egal in welcher Sprache sie befragt wurden. Zweisprachige Erwachsene dagegen fassten die Homografe gleichermaßen als Irisch oder Englisch auf, obwohl die Wörter häufiger im Irischen vorkamen. Für die Kinder wurde ferner die Identifizierung der irischen Wörter durch weitgehend übereinstimmende Aufgabenkontexte erleichtert. Die Ergebnisse deuten auf den schwachen Stand des geschriebenen Irisch bei L1-Sprachträgern hin, und weisen auf die Notwendigkeit hin, diese L1-Irisch-sprechenden zu unterstützen, im Unterricht sowie bei der Bewertung.

*Mots-clé:* zweisprachigkeit, zweisprachige lesefähigkeit, homografe, minderheitssprachen, kinder

## Introduction

### The Irish language in the *Gaeltacht*

Irish speakers in Ireland face continuous pressure from the majority language, English, affecting both the spoken and written language. The number of individuals using Irish on a daily basis continues to decline, even within designated *Gaeltacht* (Irish-speaking) regions. The term *Gaeltacht* applies to regions within Ireland where the Irish language is the community language of a significant proportion of the population, but that proportion varies substantially across the regions. The *Gaeltacht* encompasses parts of counties Donegal, Mayo, Galway and Kerry, in the west of the country, along with smaller areas within counties Cork, Meath and Waterford. The total population of the *Gaeltacht* areas is 92,874, according to a recent national census, with 66.5% of that number identified as Irish speakers (Central Statistics Office (CSO) 2006). Throughout the *Gaeltacht* regions, those identified as Irish speakers are actually bilingual, as there are few, if any, Irish speakers who do not also speak fluent English and use the language regularly. The proportion of Irish speakers in the population varies across *Gaeltacht* areas, from 45.5% in Galway city to 74% in the small *Gaeltacht* area within County Waterford in the south of the country (CSO 2006). Some *Gaeltacht* regions therefore fall below the 'threshold for sustainability' of the language, suggested by Ó Giollagáin, Mac Donnacha, Ní Chualáin, Ní Shéaghda, and O'Brien (2007) to occur at about 67% of the population.

The *Gaeltacht* region of County Galway, the area from which the sample for the present study was drawn, is the strongest *Gaeltacht*, with 30,081 inhabitants, of which 72% are Irish speakers. The region has the highest percentage of private households with Irish speakers in the country (86%). A recent national census records that a third of those within the County Galway *Gaeltacht* who use Irish outside of the education system do so on a daily basis. This is above the average of 27% for *Gaeltacht* regions overall. It is clear that the language is under considerable pressure even within *Gaeltacht* regions, and while children in these regions encounter and use the language daily at school (*Gaeltacht* schools are Irish-medium, though the degree to which they are Irish-only may vary; see Ó hÍfearnáin 2007), by adulthood opportunities to use the language have diminished substantially. Ó Giollagáin et al. (2007) found that just 9% of young people in the *Gaeltacht* reported using Irish with their peers; within 'Category A' areas (where more than 67% of the total population are daily speakers of the language) this figure rises to 24%. Furthermore, while use of Irish with family may be retained, use within peer groups continues to decline through the school years. Ó Giollagáin et al. (2007) note the influence of the English language in the media and in schools on the socialization of young people in the *Gaeltacht*.

The experience of the Irish language has also been impoverished for younger children. Home use of Irish varies substantially across households

within Gaeltacht communities and children vary considerably with respect to Irish language proficiency (see Ní Bhaoill and Ó Duibhir 2004). In many cases, an adult within the home may not speak Irish (Ó Riagáin 1997; 2001), affecting the extent to which Irish is used at home by children. Parental ability in Irish is, naturally, a significant predictor of Irish language ability in young children (see Hickey 1997). The number of school children in Gaeltacht areas with high levels of Irish language proficiency is decreasing (National Council for Curriculum and Assessment 2007), and about a quarter of children attending Gaeltacht schools were born outside the Gaeltacht (MacDonnacha, Ní Chualáin, Ní Shéaghdha, and Ní Mhainín 2005). This affects the quality of spoken Irish within Gaeltacht schools (Ó Murchú 2001; see also Hickey 1997). Further adversity faces the written language. As a minority language, Irish generally attracts less support in terms of availability of written materials, opportunities to practice reading, presence in the educational system and parental support of reading (see Hickey 1997). The range of books available in Irish that a child might read for pleasure is limited (e.g. Ó Baoill 1999, cited in Denvir 2003), and particularly beyond primary school, textbook options are similarly restricted. For these reasons it is likely that bilinguals' reading skill is not equal in the two languages and, even for those whose native language is Irish, English reading and writing are likely to predominate. Such a pattern has been observed in other minority language contexts. For example, Gerhand, Deregowski, and McAllister (1995), using a Stroop-type task, found greater automaticity of English reading for their L1 Gaelic speaker group in Scotland.

## Bilingual word recognition and homograph measures

Written word recognition in Irish might be expected to be pressured by competing word activation in the English language, as well as by intrusion of an English language context. Interlexical or cross-language homographs may be useful in addressing the influence of such factors, which in turn may provide information about the use of the two languages by Irish/English bilinguals. Many cross-language homographs share meaning: for example, the French/English 'table' or the Irish/English 'cat'. By contrast, non-cognate interlexical homographs are words with shared spelling in two languages but with different meanings and generally different pronunciations; for example, the French/English 'pain', the German/English 'Kind' and the Irish/English 'fear' (meaning 'man', and pronounced like the English 'far'). There are several such examples encountered by early readers of Irish and English, with conflicting spelling-to-sound correspondences and meanings in the two languages. (See Hickey 2007, for an overview of Irish orthography. Although Irish orthography has considerable consistency that readers might exploit, its rules are complex and it contains many letter-sound correspondences that conflict with those of English or that have no parallel

in English.) Bilingual readers seem able to initiate the necessary mappings for the currently-active language without interference from the other language such that ambiguous items are often not noticed, even though evidence suggests that both systems are active in bilinguals even when only one language is currently being employed (Grainger 1993; Van Heuven, Dijkstra, and Grainger 1998).

Many studies have employed homograph interpretation or priming measures in a lexical decision task, in which participants must decide whether a visually presented letter string is a word or not. In the bilingual case, information regarding the relative activation of the different languages can be inferred. There is now much evidence to support the suggestion that early access of words in a bilingual's lexicons occurs in a language non-selective manner (e.g. Dijkstra, Grainger, and Van Heuven, 1999; Van Hell and Dijkstra, 2002; Paulmann, Elston-Güttler, Gunter, and Kotz 2006). Beyond initial access, a number of factors may influence language activation in bilinguals. Task constraints and context affect the degree to which bilinguals operate in a language-specific manner (see Altarriba and Gianico 2003). Van Hell and Dijkstra (2002) discuss the roles of (1) task demands and stimuli, (2) current task expectations and (3) relative language fluency. These factors provide the global and local context that may affect performance. Task demands and expectations provide local information about the current task context, influencing the degree to which a bilingual will need to operate through one or other or both of his or her languages. For example, if stimuli or instructions are presented in both languages, a bilingual 'language mode' is encouraged.

According to a 'language mode' account, bilinguals' everyday language use varies along a situational continuum (Grosjean 1999; 2001). At one end of the continuum, a monolingual mode applies, as the bilingual interacts with monolinguals who share one of his or her languages. In this mode, the bilingual uses one language and the other language is 'deactivated', although deactivation is unlikely to be complete (Grosjean 1999). At the other end of the continuum is the bilingual language mode. In this mode, bilinguals interact with other bilinguals who share the two languages and mixing and code-switching occur. Language choice and the complex relationship between the 'base' language and the 'embedded' language are affected by many psychological and sociolinguistic factors. The monolingual and bilingual modes are end points on a continuum; in between, a number of intermediate modes apply, with bilinguals altering their language use as contextual or situational factors vary.

The local context may ensure that both languages activate, though one may be more active than the other at a given point in time (access to meaning in the two languages may still occur; e.g. Beauvillain and Grainger 1987). By contrast, a task that operates exclusively through one language may elicit a monolingual mode, at one end of Grosjean's continuum. The language not currently in use could be suppressed, until context dictates otherwise. The

fluency of an individual bilingual's languages represents a broader condition that may affect performance. Sensitivity to interference from L1 to L2 and L2 to L1 varies as a function of fluency, reflecting the ease with which one language attains dominance in a given context. Van Hell and Dijkstra (2002), employing trilingual participants, found effects of L2 on the dominant L1 in a task designed to elicit a monolingual (L1) language mode. However, L3 effects on L1 processing depended on a threshold being exceeded such that weaker L3 skill did not induce effects on L1. They conclude that the magnitude of cross-linguistic effects is related to the relative language fluency, which may account for differences reported across languages. A weak L2 will not easily influence L1 processing in such contexts.

Some studies suggest that while frequency affects word comprehension, disambiguation depends to a large extent on the context in which the word is encountered. For example, Gerard and Scarborough (1989) found that word frequency in the currently active language rather than the overall frequency of use in one language (in their case, Spanish or English) predicted recognition of homographs. L2 knowledge did not impinge on L1 performance, and participants appeared to be operating in a single language for the purposes of the task (although conflicting results have been reported, e.g. see review in Van Hell and Dijkstra 2002).

## Homographs as an index of language status

The Irish situation does not provide an ideal testing ground for issues of bilingual processing, given the imbalance in both spoken and written languages, but the methods outlined above may provide an insight into contextual effects on language use by Irish/English bilingual speakers. The current study used interlexical homographs to examine the status of written Irish and English words, across language contexts, in bilinguals within a strong Gaeltacht region. Here, the term 'status' refers to the rank or position of the bilingual's languages, for the individual speaker, in a particular context; this is measured by examining how easily one language is displaced, or dominates, in a bilingual language mode, as the language context changes. Based on word frequency, interpretation of the homographs was heavily biased towards the Irish interpretation. The study aimed to examine whether the participants' language background and the language in which the task was conducted would affect homograph interpretation.

The task used here is a variant of a lexical decision task; rather than deciding whether a written stimulus constitutes a word, the bilingual participants in this study had to decide if the stimulus is a word in Irish, in English, in both languages or neither of these languages. As such, the task involved categorizing written stimuli according to membership of a lexicon, requiring word recognition at the level of single lexical items. In the current context, the term 'reading' is used to refer to single word recognition and

in particular the interpretation one applies to a written stimulus such as a cross-lingual homograph.

The task required the use of both languages, as Irish words, English words and homographs were presented. If Irish/English bilinguals are presented with a homograph such as 'bean' (the Irish word for 'woman', pronounced like the English word 'ban'), it should be read as appropriate to the currently active language. Presented in the absence of context, or with both languages active, it should be read by frequency; 'bean' has a higher written frequency in Irish than in English, and the more frequent interpretation should win out. However, the pervasive influence of English with respect to both spoken and written media may place the Irish language at a disadvantage, even for those whose everyday language is Irish. This effect might be worth exploring in particular in young readers who are just acquiring competence in both languages, who will have encountered such homographs among their early words.

## The present study

This study aimed to examine performance on a lexical categorization task using Irish words, English words, homographs and nonsense words, as a function of two factors: first, the language context in which the task was presented, Irish or English; second, the language background of the participants. In Experiment 1, two groups of Gaeltacht children (aged 11–12 years) participated. While both groups lived and attended school within the same Gaeltacht area, one group spoke mainly Irish at home, while the other group was exposed to a significant amount of English at home. In Experiment 2, young adults from the same region completed the task. Local researchers identified participants and collected data to ensure that native Irish speakers were recruited; in all cases participants demonstrated age-appropriate fluency in both Irish and English. Materials were also translated locally so as to match the participants' dialect. The critical stimuli were unbalanced interlexical homographs, of higher Irish language frequency, and the type of error made on these stimuli formed the key measure. Participants completed a computerized lexical decision task which involved categorizing presented stimuli as 'Irish', 'English', 'both' (that is, homographs) or 'neither' (that is, nonwords). As recognizing the ambiguity of homographs was predicted to be a difficult task, particularly for children, errors were expected here. It was predicted that these errors would differ with context and for child and adult groups. While errors based on frequency would see participants reading the words as Irish, an English task context might be sufficient to sway interpretation to English, if the status of the Irish written words, for individual readers, is relatively fragile. Given the decreasing exposure to written Irish with age, it was predicted that such effects would be stronger in adults, with more homographs read as English in that group.

## Experiment 1

### Method

#### *Participants*

Participants were children (N = 49; 28 boys, 21 girls) aged 11–12 years who were living and attending school within the County Galway Gaeltacht in the west of Ireland. The children were recruited by local researchers, in collaboration with teachers, to ensure that all were fluent speakers of Irish and that reading difficulties were excluded. Written parental consent was acquired for all participating children. The children were assigned to conditions such that language background and the language context of the task were manipulated. Language background was determined by self-report from the child, as corroborated by a teacher, yielding two groups; those who spoke mainly Irish at home (N = 27) and those who were exposed to a significant amount of English at home (N = 22). These groups are referred to in what follows as ‘Irish background’ and ‘English background’ respectively. Participants were randomly assigned to language context conditions so that the task was completed either through Irish or through English, with all communication, interpersonal and computer-presented, conducted through one language.

#### *Stimulus materials*

Selection of word stimuli took account of written frequency and number of letters and syllables. Stimulus lists comprised twenty stimuli of each of four types: Irish words, English words, homographs, and nonwords. All consisted of 3–5 letter sequences, of 1–2 syllables. The English words averaged 730 per million words for written frequency (using Kucera and Francis 1967). The majority of these words would have been familiar to the children; the lowest frequency items were ‘trim’, ‘tape’ and ‘foil’. The Irish word list was matched on an item-by-item basis to the English words, such that numbers of letters and syllables were controlled and the written frequency was matched using an Irish language corpus, *Corpas Náisiúnta na Gaeilge* (ITÉ, 2003). The average frequency of the Irish words was 760 per million. There were no significant differences in mean frequencies of Irish words using *Corpas Náisiúnta na Gaeilge* and English words using Kucera-Francis,  $Z = 0.77$ ,  $p > 0.05$ .

There are key differences between the Kucera-Francis corpus and *Corpas Náisiúnta na Gaeilge* in terms of corpus size, date of publication and data sources, therefore two further measures were taken to ensure comparability of stimuli. In order to compare the frequencies directly, each Irish word was translated to its nearest, most accurate one word equivalent in English. These translated equivalents yielded an average frequency of 678 per million using

Kucera-Francis, with no significant difference from ratings for the English words,  $Z = 0.11$ ,  $p > 0.05$ . Subjective frequency estimates for the list of English words, homographs (English meaning and English translation of Irish meaning) and Irish word translations were also collected from a sample of English L1 young adults ( $N = 12$ ), following the method outlined by Balota, Pilotti, and Cortese (2001). The average estimates of subjective frequency showed a strong correlation with the Kucera-Francis ratings ( $r = 0.85$ ,  $p < 0.01$ ). This is consistent with Balota et al. (2001) who reported a strong correlation between the Kucera-Francis log frequencies and subjective frequency estimates using a much larger word list and sample size ( $r = 0.78$ ).

Only Irish words written without a vowel length marker (*síneadh fada*) were selected, as the presence of the diacritic would have been a clear cue to categorize the word as Irish. Mutations were included only if meaning was preserved within a single word. For example, when a mutation signals verb tense, meaning can be understood from the verb word alone, whereas a mutation following a possessive pronoun depends more on the presence of the pronoun for comprehension. For further information on mutations in Irish, Hickey (2007) provides a useful summary of the features of Irish orthography.

The homograph word list (for example: 'teach' meaning house; 'bean' meaning woman; 'fear' meaning man) was matched to the Irish and English lists for number of letters and syllables. These stimuli were unrelated written words that occur in both Irish and English and no cognates (e.g. 'cat' occurs in both languages with reference to the same animal) were included. The homograph stimuli were unbalanced or biased, in that written frequencies for the Irish interpretation were higher than frequencies for the English interpretation. The average frequency rating per million for the Irish interpretation was 910 (using *Corpas Náisiúnta na Gaeilge*; ITÉ 2003) while the English rating was on average 70 (using Kucera and Francis 1967). This frequency bias in favor of the Irish reading of the homograph was statistically significant,  $Z = 3.4$ ,  $p < 0.01$ . Again, because the two corpora have key differences, the Irish versions of the homographs were translated into their nearest single word English equivalents, yielding an average frequency per million of 1028 using Kucera-Francis. There was no significant difference between the frequency ratings for the Irish words using the Irish language corpus and using the Kucera-Francis ratings for their translated equivalents,  $Z = 0.61$ ,  $p > 0.05$ . Using the frequencies from *Corpas Náisiúnta na Gaeilge*, there were no significant differences between the ratings for the (unambiguous) Irish words and for the Irish versions of the homographs,  $Z = 0.07$ ,  $p > 0.05$ . As mentioned above, subjective ratings of frequency were provided by a sample of L1 English-speaking young adults. Their ratings of frequency were significantly higher for the English translations of the Irish meaning of the homographs (e.g. 'fear' meaning 'man') than for the English meaning (e.g. 'fear' meaning fear),  $Z = 3.6$ ,  $p < .01$ . Therefore, the Irish reading of the homographs was far more frequent than the English alternative (e.g. 'bean'



meaning woman is far more frequent in written Irish than the word *bean* in written English) and the Irish interpretation of the homographs was comparable in frequency to the Irish and English word lists.

The final set of stimuli comprised nonsense words, which were selected to match the word lists by number of letters and syllables; most were pronounceable but they did not follow closely the patterns of either Irish or English. Poor performance here might be taken to suggest a basic difficulty with word recognition or a failure to appreciate the task instructions. Similarly, a pattern of error whereby Irish words were incorrectly identified as nonwords would reflect inadequate knowledge of written Irish.

### *Procedure*

Stimuli were presented on a 15 inch monitor linked to a computer. Each stimulus was positioned centrally on the screen and subtended approximately 1.9 degrees of visual angle at a viewing distance of 60 centimeters. Participants were randomly assigned to one language condition, completing the task either through Irish or English. All instructions presented on screen and all communication with the researcher (a local fieldworker) occurred in the assigned language.

Stimuli were presented one at a time on the computer screen. All appeared in black letters on a white background. The 80 stimuli (20 of each stimulus type) were presented in randomized order for each participant. As each stimulus was presented at the center of the monitor, four response options appeared, one at each corner of the screen. Four corresponding keys, one at each corner of the keyboard, were designated as response keys. One key each was designated to respond as 'Irish', 'English', 'both' and 'neither'. The response keys on the computer were labeled using white stickers and each label appeared in the corresponding location on the computer screen. For example, the words 'Irish', 'English', 'Both' and 'Neither' (or their Irish translations in the Irish task condition) appeared at the bottom left, bottom right, top left and top right of the screen respectively. The labels on these positions did not change throughout the task for each participant, but the position of responses was counterbalanced across participants. Each participant was exposed to sample trials with one word of each type; a correct response for each was required before the next stimulus appeared. This forced the participant to produce appropriate responses for each type and also allowed the researcher to illustrate what was meant by the idea that a word could be 'both' Irish and English. Each item remained on the screen until the participant pressed a response key. Once the participant responded to a stimulus, a blank screen appeared for an inter-trial interval of 2 seconds before the next stimulus appeared. Beyond the practice stimuli, no feedback on performance was provided.

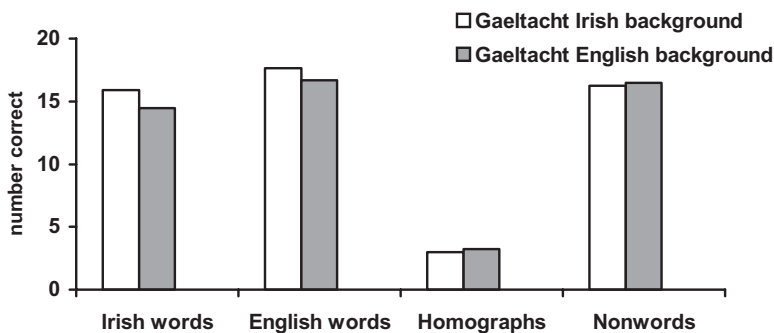
## Results

Data comprised mean accuracy scores for each of the four stimulus types. Numbers (unless stated otherwise) are mean correct responses out of a total of 20 for each word type. Initially the data were examined by mean performance as a function of language context and language background of the child.

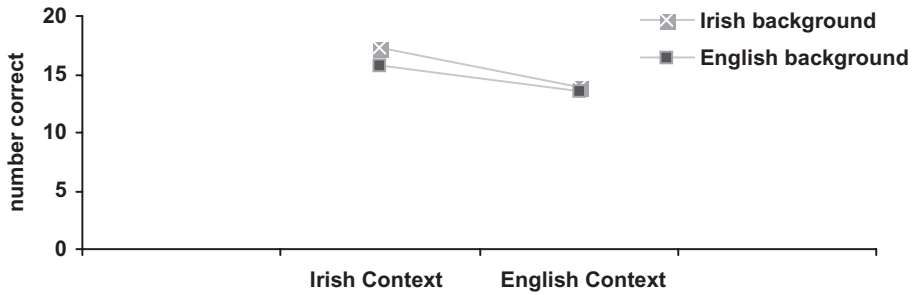
Figure 1 shows the mean number of correct responses for the four stimulus types by language background. Language background had little effect on performance, with no group differences overall. For both groups, homographs were the most difficult stimuli for the children to identify,  $M = 3$ ;  $F(3,135) = 191$ ,  $p < 0.01$ . Identification of English words was significantly better than of Irish words, with means of 17.2 and 15.3 respectively,  $t(48) = 3.5$ ,  $p < 0.01$ . The children also performed well in detecting nonwords, with a mean of 16.4 correct items. Detection of nonwords was not significantly better than identification of Irish words, nor poorer than identification of English words.

The language context in which the task was encountered was found to affect performance on the Irish word set only. Figure 2 summarizes performance as a function of language context. Categorization of the Irish words shows a statistically significant effect of context, with an average performance of 84% and 69% in the Irish and English language contexts respectively,  $F(1,45) = 6.3$ ,  $p < 0.05$ . This shows that identification of Irish words was better when the task was encountered within an Irish language context, for both groups of children. Performance drops from an average of 87% to 70% for the Irish background group, and from 79% to 68% for the group with exposure to English at home. This difference between the two groups did not reach statistical significance.

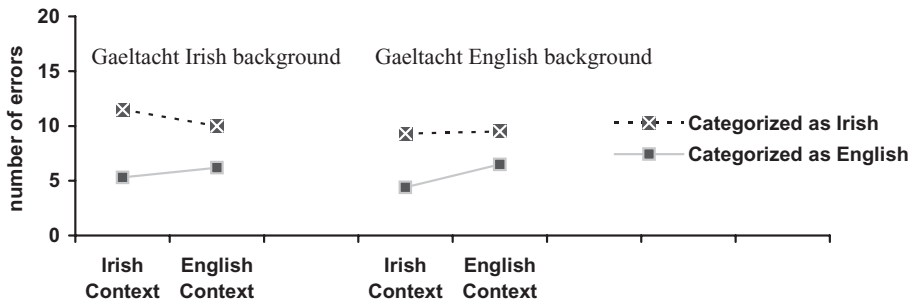
Performance on the homographs was the poorest of all the stimulus types (see Figure 1), as might be expected given the difficulty in appreciating such



**Figure 1.** Mean correct responses made by children to each stimulus type as a function of the child's language background (Experiment 1)



**Figure 2.** Mean correct responses to Irish words by children in each language context (Experiment 1)



**Figure 3.** Errors made by children on the homograph words by language background and context (Experiment 1)

ambiguity, particularly for children. Of particular interest here is the type of error made on these stimuli, as a function of language background of the child and the language context in which the task was presented. Based on word frequency alone, one would predict that bilinguals would err by reading the word as Irish if they do not respond that it could be 'both'. However, given the dominance of the English language, any such effect might be fragile and may change with the language context of the task or with the language background of the child. Errors were categorized according to whether the child chose 'Irish' or 'English' when presented with a homograph; these are presented in Figure 3.

Overall, participants were significantly more likely to interpret the homograph as being Irish than English, with a mean number of errors of 10.2 as against 5.7 respectively,  $F(1,45) = 31.8, p < 0.01$ . This suggests that the children are responding to the homographs in line with word frequency (i.e. the Irish interpretation dominates). While the number of English interpretations appeared to increase in the English language context (see Figure 3), no statistically significant effects of context or of language background were found.

## Discussion

The homograph data suggest a relatively robust status for the Irish words, in this sample. The children are likely to interpret the words in line with frequency, reading the homographs as Irish rather than English words, an effect that holds across language contexts. However, the poorer performance on Irish than on English words and the increased error affecting identification of Irish words in the English task context must also be considered. When the task was presented in an English context (that is when all computer-presented instructions and interactions with the researcher occurred in English), the children's recognition of unambiguous Irish words was poorer than when an Irish task context prevailed. This finding suggests that the status of the Irish words is not as robust as the homograph data taken alone might suggest. Given that these children encounter both spoken and written Irish every day at school, it may be that sensitivity to context increases further as this support is withdrawn. In Experiment 2, a group of young adults from the same region completed the task, in order to examine whether the interpretation of the homographs as Irish holds for an older age group.

## Experiment 2

### Method

#### *Participants*

Twenty-five bilingual adults (14 women and 11 men), aged between 18 and 24 years, participated. All were native Irish speakers living in the same Gaeltacht region as the children who participated in Experiment 1. All had completed second level education and had adequate literacy skills in both Irish and English. It was not possible to separate this group according to the language spoken at home, as all reported daily use of Irish at home, with a strong influence of English, particularly for reading purposes. For comparison, therefore, a group of L1 English-speaking adults (9 men and 11 women) completed the task. These participants were aged between 18 and 27 years. They did not come from a Gaeltacht area and did not use Irish on a daily basis. However, they would have been exposed to the language throughout their school years and would have been familiar with most words on the Irish stimulus lists. The context manipulation for this group was not equivalent to that presented to the bilingual adults, as this group was not fluent enough in Irish to be able to comprehend all the task instructions. Therefore, instructions in Irish were supplemented with English as needed. The apparatus/stimuli and procedure were otherwise as in Experiment 1.

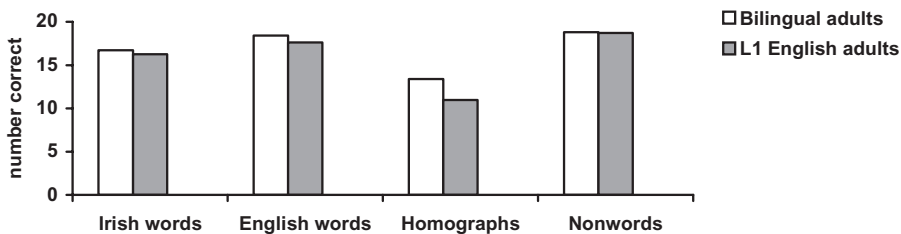
## Results

The bilingual and L1 English-speaking adults produced a similar pattern of responses to the Irish words, English words and nonwords, but differed on the homograph stimuli (see Figure 4). For both groups, accuracy for English words was higher than for Irish words,  $F(1,41) = 18.1$ ,  $p < 0.01$ ,  $M = 18$  for English words,  $M = 16.25$  for Irish words. Responses to the Irish and English words were unaffected by language context.

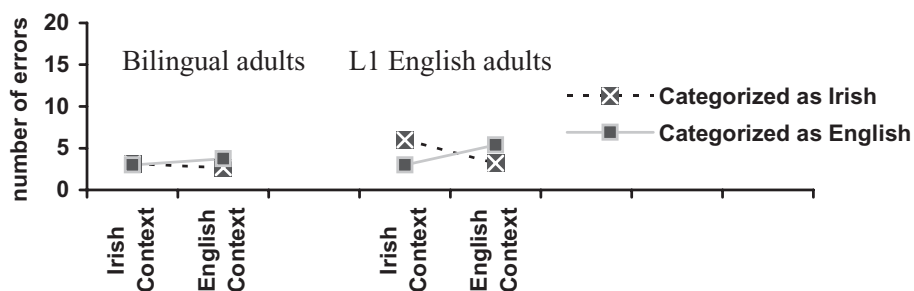
Figure 4 shows that the adults, like the children, found the homograph stimuli to be the most difficult of the four stimulus types, although performance was better than that of the children reported in Experiment 1. The bilingual group produced significantly fewer errors on the homograph stimuli ( $M = 6.6$  errors) compared to the L1 English group ( $M = 9$  errors),  $t(43)=2.2$ ,  $p < 0.05$ , suggesting that this group more readily appreciated the ambiguity of these stimuli. This could be due to their superior knowledge of Irish, their use of a bilingual language mode or enhanced metalinguistic awareness.

Analysis of errors made by adults on the homograph stimuli showed a contrasting pattern to that reported in Experiment 1 with children. Overall, there was no significant difference between the number of Irish- and English-type errors. Given the difference in the context manipulation between the two groups, the data were analyzed separately. The Gaeltacht (bilingual) adults, when they erred on the homographs, were roughly equally likely to interpret the words as being Irish (45%) or English (51%). There was no significant difference between error types, nor was there a correlation between these variables. This suggests that rather than reflecting individual preferences towards Irish or English, there is a more general weakening of the Irish interpretation such that higher written frequency is not sufficient to generate an Irish reading of the ambiguous words. However, the lower error rate of the bilingual adults must also be considered here; the majority of responses on the homograph stimuli were correct for this group (that is, these adults generally appreciated the ambiguity of this class of stimulus).

For the L1 English speaking group, error type varied predictably with language context,  $F(1,18) = 5.2$ ,  $p < 0.05$ , as significantly more errors of the



**Figure 4.** Mean accuracy for each stimulus type for the adult groups (Experiment 2)



**Figure 5.** Errors made by adults on the homograph words, by language background and context (Experiment 2)

Irish-type were made in the Irish language context, and significantly more errors of the English type occurred in the English language context (see Figure 5).

## Discussion

The adults produced superior performance on English compared to Irish words, the magnitude of the advantage being similar to that observed with children in Experiment 1 (a difference of, on average, 9 percentage points in adults compared to 9.5 for children). The adults' errors on the homograph stimuli differ from those seen with the children however. The bilingual adults produced few errors overall; when errors did occur, these participants were equally likely to mistake the homographs for Irish words as for English words. Given that the Irish interpretation had a higher written frequency, this might be interpreted as reflecting a weaker status of the Irish language compared to the pattern observed with children in Experiment 1. For comparison, an L1 English speaking group of adults was included here. The context manipulation was not equivalent for the two groups, due to differences in fluency. For the L1 English speaking adults, errors varied predictably by context; that is the higher frequency Irish interpretation of the homographs was only recognized as such when the task was carried out in Irish. For the bilingual group, context had no effect. However, the lower error rate of the bilingual adults must also be considered here. The bilingual adults were better able to detect homographs than were the L1 English speaking adults. This may reflect superior knowledge of Irish, greater metalinguistic awareness, or a bilingual language mode.

## General discussion

In Experiment 1, the children's performance produced conflicting results with regard to the status of the Irish written language. On the one hand,

homographs were more likely to be read in line with the Irish interpretation, a finding reflecting responses according to word frequency (as the homographs were biased towards the Irish based on written frequency) or by dominance of the Irish language for this group. However, on the other hand, performance for English words was significantly better than for Irish words, with 86% correct for English words as against 76.5% for Irish words, an advantage replicated with an adult sample in Experiment 2. Insofar as was feasible, care was taken to match stimuli across the English and Irish words lists; however it remains a possibility that differences in stimulus selection played a role here. The elimination of all Irish words with a diacritic vowel marker created a rather artificial list, for example. Similarly, controlling word length as well as word frequency constrained stimulus selection. Furthermore, the two language corpora used here differed considerably on key dimensions such as corpus size, date of publication and data sources. However, advantages or preferences for English reading over Irish reading have been reported in Gaeltacht children (e.g. Ó Murchú 2003), a pattern that would seem to have emerged relatively recently. De Faoite, Ó Ceallaigh, Ó Súilleabháin, and Edwards (1977) tested 516 first year post-primary pupils in schools across three Gaeltacht areas and found performance of Gaeltacht children to be superior on Irish tasks over English across measures of vocabulary, comprehension, reading and spelling, with poorer performance on the English tasks compared to an English-speaking sample. The relative disadvantage for Irish word recognition observed here may reflect, as some have argued, a school curriculum which approaches the teaching of Irish as a second language, to the detriment of those for whom Irish is the native language (e.g. MacCárthaigh 2006). The negative impact of the English language and the linguistically diverse nature of many Gaeltacht classrooms on the Irish language competence of native speakers has been noted elsewhere (see Ó Giollagáin et al. 2007).

An effect of context was evident affecting the children's recognition of Irish words. The children tested in an Irish language context correctly categorized significantly more Irish words; that is, when on-screen instructions and interactions with the researcher occurred through the medium of Irish, accuracy was improved for Irish words. When the task was conducted through the medium of English, performance on the Irish word stimuli suffered. No sensitivity to the language context of the task was apparent for English language stimuli. While the present task is a rather artificial one, there are implications nonetheless for the role of a supportive language context in teaching and assessment situations. Given the nature of the task used here, one might speculate that stronger effects of language context would emerge using a task that mirrored more closely the kinds of assessments children encounter at school. The data demonstrate the sensitivity of the 'minority' language to the influence of the dominant language, English, a pattern that is borne out in anecdotal accounts of language switching in the presence of an English-language cue. The data point to the need for particular supports for L1 speakers

of Irish and consideration of the factors that might influence evaluation of their written language skills.

The potential for facilitation of congruent learning and testing contexts has been noted in psychological literature for some time (e.g. Tulving 1982; 1983) and is suggested in bilingual studies reporting differential memory access as a function of language of test (e.g. Marian and Kaushanskaya 2007). In the present study, the language context of the task played an important role in recognition of written Irish words for these Gaeltacht children, an effect that, in this case, was independent of the child's reported language use in the home. In this study, the researchers who tested the children came from the same area and spoke the language fluently and with the appropriate dialect. The effect of context seen here may well have gone undetected had the researchers been unable to provide a complete manipulation of context. For example, testing conducted by a researcher who lacked sufficient fluency in Irish may have produced results closer to those found within the English language context, leading to an underestimation of the children's performance on Irish words. There would seem to be implications here for careful consideration of the effects of testers' or teachers' language use on the test performance of L1 Irish-speaking children.

No statistically significant between-group differences were found, suggesting that the language spoken at home had little influence on the current task for these children, who would all have had similar exposure to Irish as the language of schooling. It may be that this particular task was not sensitive to such differences. Furthermore, self-report is not ideal for identifying such sub-groups, as it may elicit information on cultural identity more than on language usage *per se*. The statistically non-significant trends of language background here may well emerge using another measure and should not be discounted entirely.

In Experiment 2, a group of young Gaeltacht (bilingual) adults completed the task, in order to gauge the status of the language for an older group who would have had more exposure to the English language. (The children were exposed to Irish every day at school.) The bilingual adults produced superior performance on English words compared to Irish words, with 92% and 83.5% correct respectively. The bilingual adults were more likely to recognize that the homograph stimuli were both Irish and English words, with 67% correct compared to 15.5% for the children. However, where errors occurred, unlike the children, the bilingual adults were roughly equally likely to read the homographs as Irish or English; while Irish-language errors accounted for 61% of the children's errors on the homograph stimuli, for the bilingual adults this figure was 45%. Given that the Irish reading of the word reflects its higher written frequency and that these participants would be considered to be native Irish speakers, this suggests a weaker status of the Irish language, for written language at least. This pattern of performance in the older age group concurs with reports from other Gaeltacht regions. For example, Ó hÍfearnáin (2007: 524), in a survey of attitudes conducted in the Músraí Gaeltacht of



County Cork, reported that parents of children in secondary and tertiary education “felt their children’s Irish to be ‘thin’ or ‘underdeveloped’ with regard to idiom, vocabulary and literary achievement in comparison to their English skills”. Similarly, Harris (2006) reported that pupils of Irish-medium schools outside the Gaeltacht outperform Gaeltacht schooled pupils on some key measures of Irish language ability. The findings of the present study support the usefulness of experimental tasks, such as the homograph decision task used here, in further informing knowledge of patterns of language use in Irish speakers.

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