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Using Parent Report to Assess Bilingual Vocabulary Acquisition: A Model from Irish

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ABSTRACT

This chapter describes the adaptation of a parent report instrument on early language development to a bilingual context. Beginning with general issues of adapting tests to any language, particular attention is placed on the issue of using parents as evaluators of child language acquisition of a minority language in a bilingual context. In Ireland, Irish is the first official language and is spoken by about 65,000 people on a daily basis. However all Irish speakers are bilingual, and children are exposed to the dominant English language at an early age. Using an adaptation of a parent report instrument, 21 typically developing children between 16 and 40 months were assessed repeatedly over two years to monitor their language development. The form allowed parents to document their children's vocabulary development in both languages. Results showed that when knowledge of both languages was accounted for, the children acquired vocabulary at rates similar to those of monolingual speakers and used translational equivalents relatively early in language development. The study also showed that parents of bilingual children could accurately identify and differentiate language development in both of the child's languages. Recommendations for adapting and using parent report instruments in bilingual language acquisition contexts are outlined.

INTRODUCTION

Crosslinguistic studies of monolingual language acquisition have demonstrated that for many languages children start babbling from about 6 months, demonstrate comprehension around nine-months and move to 'first words' (especially for people and objects) at around 12-months (Slobin, 2002). Between 18 and 24 months children move to a period of two-word combinations, albeit with limited morphosyntactic marking, and by three years most children have mastered the basic morphological and syntactic structures of the input language (Bornstein & Haynes, 1998). These milestones mean that children who fail to reach them at appropriate ages can be identified early on as having a potential language delay and appropriate intervention can be provided. However, the majority of the world's children are acquiring more than one language in the early years, and the timing and nature of language acquisition in these situations is largely unknown. Furthermore, large variations in language exposure and individual differences in the rate of language development both across and within different languages (Dale & Goodman, 2005) mean that when bilingual children are assessed in only one of their languages, they are both under- and over-identified as having a language delay (Royal College of Speech and Language Therapists, 2006). Without studies involving a representative number of typically developing bilingual and multilingual children, little progress can be made towards the accurate identification of children requiring intervention.

The guidelines for best practice for speech and language therapists as outlined by the Royal College of Speech and Language Therapists (RCSLT2006) state that assessment of communication skills should take place in all the languages to which that person is exposed. This is because bilingual children can have a smaller vocabulary in one of their languages when compared with monolingual peers, which can be misinterpreted as language

impairment (Thordardottir, Rothenberg, Rivard, & Naves, 2006). Thus it is crucial to establish descriptive bilingual norms through appropriate assessment tools. With such tools, a smaller vocabulary size in bilinguals will not be misinterpreted as being below norm and at the same time the possibility of language impairment will not be rejected simply by the assumption that bilingual children are expected to have smaller vocabularies than their monolingual peers.

Minority Language Acquisition: The Irish Situation

The bilingual situation in Republic of Ireland is no different from other countries, even though Irish, a minority language, is recognised as the first official language of the country. This means that there are statutory language rights for Irish speakers, particularly in the form of the Official Languages Act (2003), which dictates that all public services, including health and education, must be available in Irish and/or English. Irish is predominantly spoken as a daily community language in officially recognized geographical areas known as the 'Gaeltacht', which are mainly in the provinces of Munster, Connacht and county Donegal, which correspond to the three main dialects of Irish. The population of these areas is estimated to be 96,000 with 68.5% claiming to be Irish speakers (Central Statistics Office, 2012). In more recent times, Irish has become a growing community language in urban areas of Dublin and Belfast. Moreover, there has been a growth in immersion education though Irish-medium schools known as 'Gaelscoileanna', where approximately 35,000 pupils are receiving their education and engaging in extra-curricular activities through Irish. All of these factors mean that health and education services are coming under pressure to provide for this population, and this includes the ability to profile and measure their language progress. The complication for Irish-speaking children is that they have language skills distributed across two languages (De Houwer, 1995), as all Irish speakers are bilingual, and

children are exposed to the majority English language from an early age from a variety of sources. There are currently few resources available to teachers, psychologists and speech and language therapist (SLTs) working with bilingual Irish-English speakers. Brennan (2004) outlines how professionals often translate existing English tests to Irish, although acknowledges the many pitfalls associated with this practice, not least due to the fact that vast differences between the languages mean that the levels of linguistic difficulty and order of acquisition will not be the same (Pert & Letts, 2001). Assessments developed for monolingual children are clearly inappropriate for bilingual speakers (Gathercole, 2010; Gathercole & Thomas, 2009; Gutierrez-Clellen, 1996) and so 'a crucial step in advancing and developing services to Irish speakers to approximate the services provided to their English-speaking peers is the development of appropriate assessment tools and relevant developmental normative data' (Brennan, 2004: 34).

Parent Report Instruments

Dale (1991) discusses the urgent need for valid, cost-effective language assessments at an early age because of the known long-term academic and social consequences of delayed language. A randomized control trial of screening methods in the Netherlands revealed that screening toddlers who present with language delay during a preschool checkup can reduce the percentage of children who attend special school at 8 years by 30% (van Agt, van der Stege, de Ridder-Sluiter, Verhoeven, & de Koning, 2007). However, young children are notoriously difficult to assess. Some of the key methods used to date include parental diaries, direct assessments and spontaneous language sampling. While language sampling can be useful at the initial stages of collecting normative data for a particular language, and have been useful for investigating language choice, code-switching and use of morphosyntax in bilinguals, they are not as good at describing children's lexical knowledge (De Houwer,

2009). Furthermore, language sampling has the added disadvantage of being extremely time-consuming and restrictive in terms of the linguistic structures observed, while direct testing has performance and situational limitations for children under three years (Bornstein & Haynes, 1998). On the other hand, tests that involve parents as reporters of their children's language development provide a far more representative picture of a child's language under three years, as parents are more familiar with their child's language development from a wider range of situations (Dale, 1991; Dale, Bates, Reznick, & Morrisset, 1989). Moreover, as parent report forms can be filled in online, or obtained through the post, they enable the collection of rich data from relatively large populations in a cost-effective manner. Among the most widely used parent report instruments are the MacArthur-Bates CDIs (Fenson et al., 2007) and numerous studies have shown them to be effective and efficient tools for assessing early language development, providing a rapid overall evaluation that can serve both screening and research purposes.

The CDIs have now been adapted into over 40 languages, and studies have demonstrated that the vocabulary checklists correlate significantly and positively with laboratory measures of free speech, and non-word repetition (Stokes & Klee, 2009), while grammatical measures correlate with direct measures of morphosyntax including measures of mean length of utterance (Dale, 1991). Their wide-ranging application means that they are slowly coming to the fore in the study of language acquisition in young children. The instruments have been used to explore important theoretical issues, such as estimating the relative contributions of genetic versus environmental factors to the rate of language development (Dionne, Dale, Boivin, & Plomin, 2003; Price et al., 2000), and determining the prevalence and predictors of language delay (Horwitz et al., 2003). There are currently three versions of the American-English CDI; the 'Words and Gestures' scale, which assesses prelinguistic communication and receptive/ expressive vocabulary in 8- to 16-month-olds; the

'Words and Sentences' scale for 16- to 30-month-old children, which looks at expressive vocabulary and early morphosyntax; and the 'CDI-III' for 30- to 37-month-olds, which addresses expressive vocabulary, morphosyntactic and semantic-pragmatic development (Fenson et al., 2007).

Parent Report of Bilingual Language Acquisition

Parent report measures have also been used in previous studies of bilingual children. For example, Pearson, Fernandez and Oller (1993) used the Spanish and English versions of the CDI to compare the language development of bilingual children with monolingual children. For the bilingual children, the two monolingual versions of the CDI were used, and the authors then attempted to disentangle the most appropriate way of interpreting the vocabulary scores derived for the bilingual children in order to compare their scores to monolingual children. As well as the single language measures (for English- and Spanish-only vocabulary) a 'Total Vocabulary' (TV) score was calculated. This was comprised of the total number of words or sound-meaning pairings reported by the parents across the two languages. The authors then mapped between the two versions of the CDI and calculated a 'Total Conceptual Vocabulary' (TCV) score based on the number of concepts that were lexicalised by the children in either language, only counting translational equivalents once. The authors concluded that when TCV was used as a comparative measure, bilingual children had a similar vocabulary size as monolinguals. Junker & Stockman (2002) carried similar studies out using the German and English versions of the CDI with bilingual children, and found that the children had similar vocabulary scores, even if they were only credited for their stronger language. They recommended taking four vocabulary scores from CDIs, including total vocabulary in Language A and Language B as well as the aforementioned TV and TCV.

Although TCV is a more conservative measure of vocabulary knowledge, Pearson et al. (1993) caution that it may be misleading in that apparent translational equivalent pairs may not be used in the same way for children as they are for adults. They describe a situation in which a bilingual child used the Spanish word *barco* for sailboats but the English term *boat* for all other kinds of boats. In this case, TCV would actually underestimate a child's vocabulary knowledge as both words would only be counted once. In fact, Thordardottir, Rothenbert, Rivard & Naves (2006), using the French and English versions of the CDI with monolingual and bilingual children, did find that balanced bilingual children (with 50:50 exposure to both languages) scored lower than monolinguals when TCV was used as a comparison, although they had higher vocabulary scores than monolinguals when TV was used as a comparison. These authors concluded that TCV was a better vocabulary measure for children with unequal exposure to their languages, as those children included in the Pearson et al. (1993) and the Junker and Stockman (2002) studies, but TV might be more appropriate for those with balanced exposure to the two languages. Total vocabulary also captured the vocabulary development in a group of Spanish-English bilinguals with on average equal input in both languages more reliably than a single vocabulary measure in a study by Hoff et al. (2012). Furthermore, Thordardottir et al. (2006) noted that the bilingual children were delayed on vocabulary development in English when compared with the monolingual English group but had similar scores in French when compared with the monolingual French children. This was not the case for Dutch-French bilinguals, who reached similar vocabulary levels to monolingual norms both languages (and better measures than TCV) for children exposed to both languages from birth (De Houwer, 2010). Therefore, in addition to the amount of bilingual exposure to a particular language, language-specific factors might result in differences in vocabulary scores, and this should be considered in bilingual studies using the CDIs.

Other studies that have focused on the issue of translational equivalents in bilinguals include Gatt, Letts & Klee's (2008) study using the Maltese version of the CDI. This CDI contains some English lexical entries due to the high language contact situation in Malta. These authors compared vocabulary scores reported by parents to scores obtained from spontaneous language samples of 12- to 30-month-olds. They noted that although parents reported that their children used translational equivalents on the CDI, this was not reflected in the language samples. However, loan words were found in both measures. A study by De Houwer & Bornstein and De Coster (2006) with Dutch and French versions of the CDI found that young children comprehended translational equivalents early in language development. Both studies support the notion that bilingual children understand and produce translational equivalents early in language acquisition.

Finally, Marchman and Martínez-Sussman (2002) and Marchman, Martínez-Sussman, and Dale (2004) carried out a series of studies looking at the validity of using the CDIs with bilinguals by having the parents of bilingual Spanish-English children fill out the form in both languages and comparing the results to spontaneous and structured language measures. They found strong correlations between the various language measures on the CDIs and spontaneous and structured language measures, including vocabulary and grammar, although they noted that within-language correlations were moderate to strong whereas cross-language correlations were weaker and non-significant. The results demonstrated that the association between lexical and grammatical learning did not result from a general cognitive ability but was linked to the vocabulary and grammar within a particular language. They also noted that parents could accurately report on the child's lexical acquisition in each language, even if they were speakers of both languages themselves.

To summarise, most studies have found the CDIs to be a useful way of assessing and investigating bilingual vocabulary acquisition. Nonetheless, apart from the language contact situation accounted for through the inclusion of some English items in the Maltese adaptation (Gatt et al., 2008), previous studies have used CDIs that were developed for monolingual speakers of each language and used the tests independently to measure vocabulary in children before attempting to map between the two adaptations to determine overall vocabulary size. However, being bilingual is not the same as being monolingual in two languages, and most adaptations of the CDI contain idiosyncrasies related to the target culture and language of the adaptation. This means that it is not possible to completely map directly between the two single-language versions. To date, there are no adaptations of the CDIs for bilingual children, and so this study represents the first of its kind in that all of the lexical items are measured in both languages. This is possible in the Irish context as early contact with a socially dominant English language is the norm, and so a single parent report form incorporating all aspects of bilingual language acquisition for these languages is appropriate. Furthermore, as there are no monolingual Irish-speaking adults, parents can report on their children's language development in both languages. This study therefore provides a test case for adapting a parent report to a bilingual context. First, the initial adaptation of the checklist from the original CDI to Irish will be outlined, and then how it was used to collect longitudinal data on the vocabulary development of 21 children acquiring Irish as a first language from 16- to 40-months will be explored. Following this analysis, a revision of the CDI for assessing Irish bilingual children and bilingual children in general will be proposed.

METHOD

Irish Adaptation

The initial Irish-adaptation of the CDI: Words and Sentences scale (ICDI) was used in this study. While the adaptation has been described elsewhere (O'Toole & Fletcher, 2008) a brief outline of the vocabulary section will be described here. In the original study, the vocabulary items were listed in Irish, and two columns were placed alongside the items, so parents could select whether their child used the words in Irish, English or in both languages (translational equivalents) by selecting both columns (Bates, Dale, & Thal, 1995). A small excerpt from the original is shown in Figure 1.

Figure 1: Vocabulary items on the Irish CDI (O'Toole & Fletcher, 2008)

***3. FEITHICLÍ (F*íor nó bréagáin) (19) VEHICLES (Real or toy)**								
	Gaeilge Irish	*Béarla* English		*Gaeilge* Irish	*Béarla* English		*Gaeilge* Irish	*Béarla* English
bád	○	○	JCB	○	○	tochaltóir/ bainteoir	○	○
bus	○	○	jeep	○	○	traein	○	○
carr/ gluaisteán/ mótar	○	○	leoraí	○	○	tarracóir	○	○
eitleán	○	○	long	○	○	trucail	○	○
gluaisrothar	○	○	otharcharr	○	○	veain	○	○
héileacaptar	○	○	pram/bugaí	○	○			
inneall dóiteáin	○	○	rothar	○	○			

A number of loan words were also included, in line with the adaptation by Gatt et al (2008). Although there is debate as to whether a lexical item is a 'loan word' or a 'code-switch' (Deuchar, 2008), for the purposes of the current study, a 'loan word' was considered to be any English word which has been naturalised into the phonology, morphosyntax and everyday use of Irish, such as *jeep*. In addition, some Irish words are cognates with English, including *bugaí* /bʌgi/*buggy*, *cairdeagan* /kaɹdəgən/*cardigan* and *moncaí* /mʌŋki/ *monkey.* In this initial adaptation, parents could decide whether they felt the child was using the Irish or English word for loan words and cognates, or both, by selecting the appropriate column(s).

Participants

All of the families were from the Munster region in the South of Ireland and were required to have Irish as a majority language of the home (spoken at least 60% of the time or more) to participate, although most families reported between 90-100% Irish use in the home. In order to establish the level of exposure to Irish among the children, parents completed a language background questionnaire at the beginning of the study to provide a comprehensive picture of the English and Irish input for each child. Parents indicated the primary language(s) of the home as well as the language(s) the child was exposed to from people in regular contact with the child. They also estimated the overall proportion of time that the child was exposed to Irish and English. There were 12 girls and 9 boys and more of the mothers had Irish as a first language than the fathers. All but one of the mothers were the primary carers of the children on a daily basis, and the other child was looked after by an Irish-speaking child-minder on weekdays from 9 am to 3 pm.

Procedure

Two types of data were collected at each visit: an Irish CDI (ICDI) checklist and a spontaneous language sample to establish the validity of the parent report.

1. *CDI data*: The parents completed a checklist on the children between the ages of 16- to 40- months over a two-year period. Repeated checklists were completed at six-monthly intervals for children up to 40-months in order to collect longitudinal data. This resulted in 49 checklists overall, with one child contributing four checklists, ten children three checklists, five two checklists and five children just one checklist as they were older when they first took part in the study. At each visit, the parents completed the ICDI and were asked to report on spontaneous production of a word rather than elicited repetition or imitation. The child was credited as saying a word even if s/he did not pronounce it accurately (e.g. /wɑdə/ was accepted for *madra*, 'dog'). Parents were allowed to include dialectal variants not part of the *caighdeán* or standard language (e.g. *tráigh* for *trá*, 'beach') or other word alternatives if the child was not using the standard form (e.g. *casóg* for *cóta*, 'coat'). However, parents were not allowed to include additional concepts that were not on the checklist. Depending on the age of the child and his/her level of expressive language, the checklist took between 20 and 60 minutes to complete.
2. *Spontaneous language sample*: In addition, a spontaneous language sample involving the parent and child, of approximately 15 minutes, was videotaped at each time point. The same parent who completed the ICDI checklist was involved in the language sample. Parents were provided with a standard set of toys (a doll's house containing four dolls, a dog, and a car), as well as a selection of Irish picture books in an attempt to reduce variability across the language samples, and were asked to play with the child as he or she would normally do at home.

Data analysis

From the CDI checklists, a number of vocabulary scores were derived: Total Irish vocabulary (total number of words, excluding any words only known in English), Total

English vocabulary (total number of words, excluding all the words the child only knew in Irish), Total Conceptual Vocabulary (TCV: the total number of concepts reported in English only, Irish only and translational equivalents), and Total Vocabulary (TV, words known in both English and Irish). From the videotaped conversational samples the number of English and Irish words was also coded so that they could be compared to the number of English words noted by parents on the ICDI checklist. CLAN (Computerised Language Analysis (MacWhinney, 2003)) was then used to calculate a number of linguistic measures from the speech samples. These included the Number of Different Words in Irish (NDW), based on a 100-utterance sample; D (Richards & Malvern, 1997), a measure of lexical diversity that is argued to be independent of sample size; and the total number of English words. These measures were later used to establish the validity of the Irish CDI, full details of which can be found in O'Toole & Fletcher (2010). For this analysis, the data were treated as cross-sectional and the children were grouped into four age groups ('18-, 24-, 30- and 36-month-olds'), as it was not possible to use each monthly age for comparison due to the limited number observations at certain ages. As previously outlined, this meant that most children contributed more than one data point.

RESULTS

Vocabulary Size

Table 1 presents the vocabulary scores obtained from the checklists and the spontaneous samples.

Table 1: Mean vocabulary score on the ICDI and spontaneous language samples

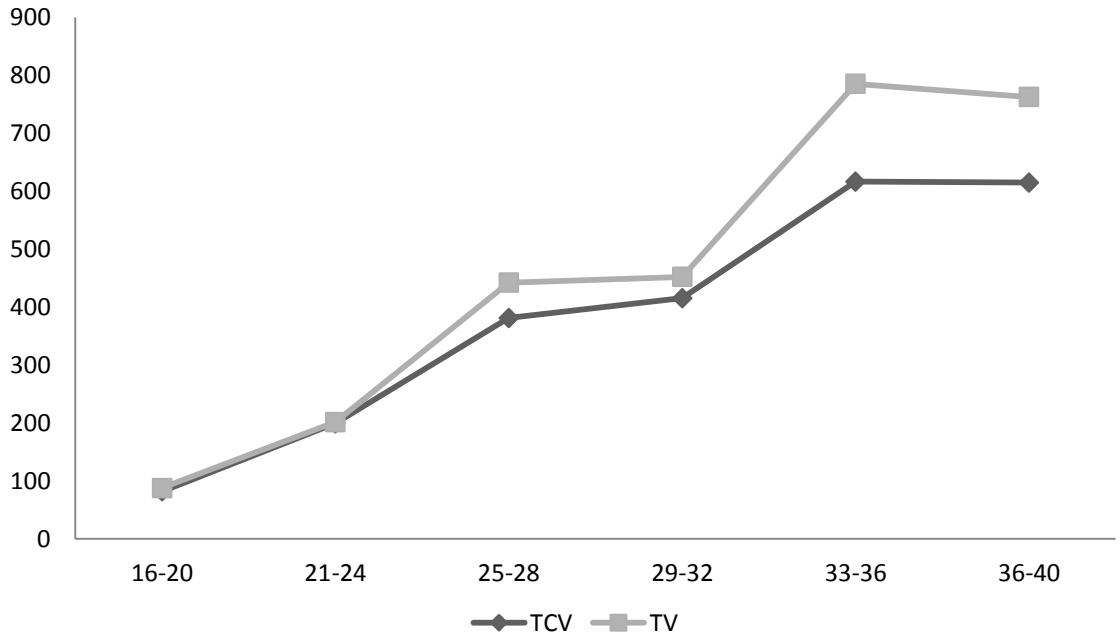
Age Groups (in months)								
	'18 month olds'		**'24 month olds'**		**'30 month olds'**		**'36 month olds'**	
Measure	*16-21 (n=10)*		*22-27 (n=11)*		*28-33 (n=13)*		*34-40 (n=14)*	
	Mean *(SD)*	Range	Mean *(SD)*	Range	Mean *(SD)*	Range	Mean *(SD)*	Range
ICDI Parent Report								
Total Conceptual Vocabulary	81.2 (*113.1)*	3 -378	240.3 *(157.4)*	20-432	440.1 *(214)*	115-715	634.7 *(141.9)*	377 – 824
Total Vocabulary	86.5 *(125.4)*	3 - 417	242.73 *(159.4)*	20-437	511.62 *(296.4)*	115-1059	769 *(336)*	377-1260
Irish (only) **Vocabulary**	70 (*91)*	3 - 308	219.9 *(143.9)*	20-426	345.7 *(193.3)*	108 – 658	405.4 *(244.9)*	53 – 793
English (only) **vocabulary**	5.9 *(10.3)*	0 - 31	16.6 *(19.5)*	0 - 53	28.1 *(24.5)*	0 - 89	41.7 *(44.2)*	0 – 137
Bilingual Vocabulary	5.3 *(12.6)*	0 - 39	3.64 *(5.2)*	0 - 14	66.1 *(128.9)*	0 - 392	187.6 *(241.2)*	0 – 535
Language Sample								
NDW (100)	26.4 *(23.2)*	3 - 60	63.1 *(25.4)*	24-105	98.9 *(27.8)*	49-143	117.5 *(23.6)*	89 – 174
D	10 *(11.5)*	1 - 32	35.2 *(26.3)*	3 - 86	59.2 *(32.7)*	16.3-117.5	80.1 *(45.5)*	36 – 195
No. of English words (100)	1.6 *(2.9)*	0 - 9	7.9 *(9.2)*	0-32	10.85 *(15.29)*	0-60	19.79 *(24.38)*	1-71

NDW- Number of Different Words; D= lexical diversity;

As can be seen, all vocabulary measures, whether obtained from the CDI or the spontaneous samples, increased with age. For the younger ages, the standard deviations were larger than the means on most language measures for both the CDI and the spontaneous language samples, reflecting the huge variability in language development at this age. This variability was reduced in the older age groups, although there was still a great deal of variability in the vocabulary measures, particularly in the number of English vocabulary items used in the language samples. Overall however, the number of words the children knew in English or bilingually (i.e. translational equivalents) increased with age, and so by 36 months of age the children knew over one-quarter of their total vocabulary in both Irish and English.

In order to examine these data closely, we compared the growth in vocabulary development over the age groups, depending on whether Total Conceptual Vocabulary or Total Vocabulary was used as a comparison. A paired sample t-test for the entire group revealed that, as expected, there was a significant difference between TCV and TV for the entire group ($t(48)= 3.15$, $p\leq .01$), with the mean values for TV being higher than TCV. Post-hoc analysis revealed that this difference was only significant after 36-months of age, however ($t(14)- 2.75$, $p<.04$), with the mean total conceptual vocabulary score (694) being lower than mean total vocabulary (796). The values are represented graphically across the different age groups in Figure 2.

Figure 2: Total Vocabulary and Total Conceptual Vocabulary across the ages



Validity

In the language exposure interview, the parents estimated the average percentage of time that Irish was used in the home, and it was reported to be very high, at an average of 92.4% Irish input. This was similar to the 94.5% Irish-only words reported on the ICDI and 92.2% Irish words found in the spontaneous samples. However, Pearson correlations revealed that there was not a significant association between the reported amount of Irish input with either the reported or observed vocabulary measures. On the other hand, a significantly positive association was found between the various vocabulary measures on the ICDI and direct observations of language from spontaneous language measures. The Pearson correlations for the entire validation sample (n=49) are given in Table 2. The correlations controlling for age are shown in brackets. Due to the multiple comparisons involved, statistical significance was set at .01 to control for a Type 1 error. Apart from D, all spontaneous language measures of vocabulary were based on a 100-utterance sample, as they have been found to be affected by sample size (Owen & Leonard, 2002). All correlations including the entire group of children were significant at $p \leq .001$. The correlations controlling for age were also significant for the group, except for the relations between the Total Vocabulary and Number of Different Words (NDW), Total English Vocab and NDW and between the Total Irish Vocab and the number of English words

Table 2: Correlations of Vocabulary measures on the ICDI and spontaneous sample

(p values were set at .01 to control for Type 1 errors; unless otherwise noted, all correlations were significant at p < .001)

		Spontaneous Measure		
		D	*NDW (100)*	*No. English Words (100)*
ICDI Reported Measures	*Total Conceptual Vocabulary*	.75 *(.56)*	.88 *(.66)*	.50 *(.33*)*
	Total Vocabulary	.71 *(.69)*	.42 (ns) *(.39, ns)*	.72 *(.79)*
	Total Irish Vocabulary	.71 *(.48)*	.87 *(.64)*	.46 *(.24, ns)*
	Total English Vocabulary	.68 *(.59)*	.46 *(.24, ns)*	.83 *(.80)*

** p=0.25; df=46*

DISCUSSION

These results can be reviewed in terms of the validity of a bilingual adaptation of the CDI for capturing children's acquisition of vocabulary. First, when both languages were considered, the vocabulary development of the Irish-speakers is in line with that of monolingual children (O'Toole & Fletcher, 2010). For instance, at 24 months, Irish-speaking children knew an average of 240 words (based on Total Conceptual Vocabulary); this compares with 292 words for American-English-speaking children (Fenson et al., 2007); 261 for Italian children (Caselli, Casadio, & Bates, 2001), and 221 for Danish children (Bleses et al., 2008). The vocabulary sizes were also in line with those reported in studies involving other bilingual children (Barrena, Ezeizabarrena, & Garcia, 2008; Genesee, 2006; Pearson et al., 1993). As outlined in Table 2, the children knew 7% of their words in both languages at 18 months, but by 3 years, approximately 28% of their total vocabulary consisted of translational equivalents. This is later than in other reported studies of translational

equivalents (De Houwer et al., 2006; Gatt et al., 2008) and may be due to the anecdotal reports from parents in this study that they tried to reduce the amount of exposure to English for as long as possible with their young children.

The vocabulary measures derived from the ICDI demonstrated that, in the early years, there was not a large difference between Total Vocabulary (TV) and Total Conceptual Vocabulary (TCV), but after 30 months, as might be expected TCV was lower than TV. As previously outlined, Patterson & Pearson (2004) and Thordadottir et al. (2006) recommend using both TV and TCV measures for bilinguals, and hold that TV should be used for children with equal exposure to both languages so that children with a high proportion of translational equivalents are not misidentified as having small vocabularies. Pearson et al (1993) hold that the most accurate estimate of a bilingual child's true conceptual vocabulary probably lies somewhere between TCV and TV. In the current study, the results indicated that the children were likely to have had dominant exposure to Irish until about 30 months, and then as their exposure to English increased, they became more balanced. However, as there was a wide range in the number of English-only words used (from 0 to 137 at 36-months) the decision to use TV or TCV as a measure of overall vocabulary size might need to be considered on an individual basis, depending on the language exposure levels of the particular child.

The analysis also considered whether parents' estimates of the amount of exposure to Irish were similar to the number of words in each language reported on the ICDI and observed in the spontaneous language samples. Despite the fact that the estimated percentage of Irish language input was very similar to the overall percentage of Irish words on the ICDI and in spontaneous measures, there was no significant correlation between these measures. This is in contrast to other studies of bilingual language development, including the studies

by Patterson (2000) and Pearson, Fernandez, Lewedag & Oller (1997), who found that parental estimations of the amount of exposure to each language strongly and positively correlate with children's vocabulary growth in each language. In the current study, the lack of association may have been because the language background questions were only completed on the first visit and not on subsequent visits, and because the children were near ceiling on the amount of exposure estimates to Irish and so did not provide sufficient variation to enable correlation. This highlights the importance of regular and repeated language exposure measures when carrying out bilingual language research, not least as the exposure patterns change as the child's language develops, and experiences beyond the home change over time (De Houwer, 2009). It might also have been the case that parents were not accurate in their estimates of language exposure, particularly as Quay (2008) found that parents were not accurate in reporting the amount of exposure to the less dominant language in minority language contexts. This is one of the pitfalls previous researchers have noted in bilingual language research, as despite efforts to gather accurate measurements as to the amount of exposure to each language via interviews and questionnaires, these can be biased by the language choice of the interview (Edwards, 2004).

In contrast to the lack of an observed association between language exposure estimates and reported and observed vocabulary in each language, there was a strong correlation between the number of words the children were reported to say in each language on the ICDI and similar vocabulary measures from the spontaneous language samples. As regards lexical diversity, both lexical diversity 'D' and Number of Different Words 'NDW' as derived from the spontaneous samples had strong positive correlations with the measures for Irish and English words reported on the ICDI. In addition, the number of English words reported on the ICDI had the strongest correlation with the number of English words found in

the spontaneous sample, indicating that the ICDI captures vocabulary development in both languages well. The data are in line with previous studies using parent report with bilingual children, such as Patterson (2000), who reported strong correlations ($r = .91$, $p < .01$) between observed and reported measures of language development, and Marchman and Martinez-Sussmann (2002), who found high correlations between the CDI and various spontaneous language measures ($r \geq .79$, $p < .01$ for all comparisons). This confirms that parents can accurately discriminate children's Irish and English words when completing the Irish CDI, even though they are all speakers of both languages. Marchman & Martinez-Sussman (2002) reported similar findings for Spanish-English bilingual parents. In the current study, both the Total Number of Words (TNW) and D had higher correlations than NDW with the number of English words in the spontaneous language sample. As D is less reliant on sample size than TNW (Richards & Malvern, 1997), it may be a more reliable measure of vocabulary diversity in bilinguals.

Methodological implications for using parent report with bilingual children

This study showed that parental reports can provide an accurate and valid description of bilingual language acquisition in a minority language context. However, Thordardottir et al. (2006) suggest that the ideal procedure for assessing bilingual children would be to develop specific tests that address the unique feature of bilingual development, rather than adapting monolingual tests. Therefore, reflection on the results of this study and the CDI format used has lead to some revisions to the Irish-English CDI, which will now be outlined. In addition, suggestions for using the CDIs with all bilingual children will be explored.

The first issue was the fact that in the initial adaptation of the CDI to Irish, the words were only listed in Irish and if parents wanted to indicate that their child used the English

equivalent, they had to mentally translate the word and then select the 'English' column (as illustrated in Figure 1). This was possible in the current study, as all Irish speakers are bilingual; however it did place an additional demand on the parents. Others reporting in the literature also raised this issue as problematic when using parent report with bilinguals, and so Patterson (2004) recommended using side-by-side translations of vocabulary items. This was in response to a study by Rescorla & Achenback (2002), which stated that bilingual children had delayed vocabulary compared to monolinguals, but which had given parents an English version of the Language Development Survey parent report form (a similar tool to the CDI), but allowed parents to include the Spanish equivalent of a word if their child used that word. Patterson (2004) criticised this method, as parents had to translate the form, placing an additional burden on them. She proposed that using side-by-side translational equivalents of vocabulary items was more valid and reliable for bilingual report forms. In addition, Dale et al. (1989) recommended that a recognition format should be used so that parents do not have to rely on memory as they do when vocabulary is presented in only one language. Therefore we developed an updated adaptation of the Irish CDI that lists all vocabulary in Irish and in English to remove this burden on parents, as is illustrated in Figure 3. Another issue that arose from the present study was the difficulty parents experienced in determining which language they should decide that cognates and common words belong to ({David, 2005 #478}David and Li, 2005, Pearson et al, 1993). For example, the Irish word *traein* /tʲeːn/ and English *train* are pronounced very similarly in Irish and English, even more so when child phonology is considered. As parents are encouraged to credit the child with using a word whether or not they pronounce it accurately on the CDI, it is unlikely that parents can discriminate which language the child is using the word in. There are many words in Irish that are loan words adopted from English and so only subtle phonological differences occur. Furthermore, there are many cognates (e.g. *bus* and *banana* in Irish and English). It is

possible that young children are not making a distinction between these word pairs, and at the very least, parents may be unable to determine which language such words belong to. This was also noted as a problem in bilingual situations of typologically close languages such as Galician-Spanish bilinguals (Pérez-Pereira, 2008). Our proposal is to treat such items on the CDI differently from other vocabulary pairs in the child's two languages. Specifically, in the updated adaptation of the Irish CDI, we propose that such words be counted as a single item (as shown in Figure 3). For example, while *bád* and *boat* are provided as two options for parents, the cognate *bus* is only listed once, as is the loanword *veain* (*van*). Where alternate spelling for the Irish words exists, these are included in parentheses, but parents no longer have to decide which language the child uses the item in. This allows for such items to be counted differently from the items for which the two languages differ and they are considered as 'translational equivalents' and so contribute to the Total Conceptual Vocabulary score, but not the Irish- or English-only vocabulary score. The benefit of this change is that in addition to capturing a more accurate depiction of the child's knowledge at any given moment, removing the difficulty of deciding how to treat such words for parents should also make completion of the ICDI faster, as they do not have to reflect on which language their child is using the word.

Figure 3: Updated vocabulary checklist

***3. FEITHICLÍ (Fí*or nó bréagáin) (17)** **VEHICLES (Real or toy)**												
bád	○	boat	○	jeep		○		tarracóir	○	tractor	○	
bus		○		lorry (leoraí)		○		tochaltóir/ bainteoir	○	digger	○	
carr/ mótar/ gluaisteán/ srl.	○	car	○	long	○	ship	○	train (traein)		○		
eitleán	○	airplane	○	otharcharr	○	ambulance	○	truck (trucail)		○		
gluaisrothar	○	motorbike	○	pram/ buggy (bugaí)		○		van (veain)		○		
helicopter (héileacaptar)		○		rothar	○	bike	○					

The revised version of the Irish CDI includes other aspects that are not relevant to the present study, but that are worthy of mention. First, as a parent report should capture all that is relevant for and unique to bilingual language acquisition, questions regarding code-switching have been included. In the 'grammar' section of the CDI, parents are now invited to provide examples of the type of sentences in which their children code-switch, and the three most recent longest sentences they are asked to provide can now be in either or both (mixed) languages. Secondly, as future research using the test aims to capture bilingual language acquisition for Irish children with varying degrees of bilingualism, the form has been re-adapted so that all of the instructions are in both languages. It is hoped that this will result in more accurate reflection of language exposure and use, and inhibit parents from going into 'monolingual mode', which can be a pitfall of bilingual research (Grosjean, 2004). The ICDI is currently being used with a wider group of children with varying degrees of bilingual language input. It is acknowledged that including a heterogeneous group of children who vary in the amount and consistency of exposure to the languages makes it problematic when trying to identify normative patterns that apply to all children (Genesee, 2006). For this reason, future norms will adapt a model recommended for Welsh vocabulary scores by Gathercole, Thomas, & Hughes (2008), whereby vocabulary norms are not only related to the child's age, but also to exposure to the language in question. As they have proposed, two types of normative scores will be provided: a general score comparing a given child to all children of the same age, and a second score that indicates a child's placement relative to children with similar language exposure profiles. The intention is that normative information will be available for children from predominantly Irish-only homes, Irish-English and English-only homes (where children are only exposed to Irish at preschool), as in the Welsh model. As noted in the discussion, however, language exposure information must be obtained through detailed questioning of the parents and should be measured at 6-monthly intervals in

longitudinal studies, as it can change over time. It is worth mentioning that for children who are described as dominant in one language, it may be appropriate to compare their scores to monolingual norms where available, as some studies have found no difference between these measures (Barrena et al., 2008).

For other researchers considering using parent report instruments with young bilingual children, a number of additional considerations are now provided. In the current study, all Irish speakers are also proficient speakers of English and so could report on a child's development in both languages. However this would be unusual in many other bilingual contexts, and so multiple reporters may be required to complete the form, particularly as many parents will only speak one of the child's languages or some children will learn one language at home, but another in day care, meaning that both parents may not have sufficient knowledge of the second language to be able to complete both forms. A study by De Houwer, et al. (2006) had up to three people (e.g. both parents and a regular caretaker) fill out the CDI for Dutch-French bilingual children. They then used a cumulative score to calculate the child's total vocabulary, which credited the child with the best score for any item on the CDI as checked by a single reporter. Therefore, a word was credited as 'understood' if at least one rater indicated that the child understood it in one or either language. De Houwer et al. (2006) hold that having multiple reporters may ultimately increase the reliability and inter-individual comparisons of the CDI, and lead to more accurate insight into the structure and nature of early vocabulary in bilinguals. Marchman & Martinez-Sussman (2002) also found that multiple reporters could provide a view of lexical and grammatical development that was as good as, and sometimes better than, a single reporter. Future studies should therefore consider having a second parent and/or caregiver complete the form, to provide a more representative profile of the child's language skills.

Final Note: Speech and Language Therapists working with Irish-speakers

A recent study in Ireland (O'Toole & Hickey, 2013) interviewed eight speech and language therapists and four psychologists who were employed to provide services to Irish-speaking populations. Preliminary analysis of the themes identified in the interviews highlighted that, although there were significant regional variations in local demand for services in Irish, it was clear that a monolingual model of service delivery was being applied. Therefore, families opted to have their speech and language therapy in either English or Irish, often indicating this on the referral form prior to the appointment. In a bilingual language community where speakers need to have a command of both languages depending on the situation (home, school, peers, wider community etc.), applying a monolingual model does not meet their needs and may result in parents opting for therapy and additional education services in one language (generally the majority language) rather than in both, and ultimately dropping the minority language.

Another issue that arose was that in Ireland the Department of Education allows for the provision of three hours per week of individual resource teaching for children identified as having Specific Language Impairment (Department of Education and Science, 2007). However, in order to receive a diagnosis of SLI, children have to have a non-verbal IQ of 90 or more, and have to have received a total language score that is more than two standard deviations below the mean on a standardised language assessment. Often this means that therapists have translated tests in order to test children's language in Irish, and then converted the raw scores achieved to standard scores based on the English norming data. This means that not only is an entirely different population sample being compared for the purpose of establishing a norm-reference score, but an entirely different language is used. Beyond these issues, there are no psychological assessments available in Irish, and so children are only

assessed through English, which may be their weaker language. The professionals expressed their frustration at this, but stated that they had no choice but to continue with this practice so that the children could receive the resources they were entitled to. This practice reflects the reality of current service provision for bilingual populations and the major need to develop appropriate assessments. It is our hope that by helping to develop bilingually-normed assessment measures, therapists will be able to capture the language development of these children in both of their languages so those with genuine needs can be identified and receive appropriate intervention.

Conclusions

There may never be large enough numbers of children speaking Irish as their first language available to provide the psychometric properties necessary to provide true 'norms' for tests like that we are developing, and the wide variability across dialects, as well as the bilingual status of all Irish speakers, provide further complications. Nonetheless, a descriptive framework for the typical developmental profiles as is provided in the current study is valuable to qualitatively evaluate and compare the language skills of a child suspected of having difficulties (Brennan, 2004). The Irish CDI reliably and conveniently captures children's acquisition of both Irish and English across ages and shows that parents can accurately and reliably report on their child's knowledge of both languages in a single form. It represents the first language assessment of its kind for the Irish language and for addressing the bilingual nature of Irish acquisition, developed to help diagnose and treat those with language delay. It can hopefully lead to the development of more assessments, both for Irish and for other languages. However further research incorporating revisions to the form to make allowances for the bilingual nature of Irish language acquisition and involving larger groups of children from a variety of language backgrounds is necessary.

Finally, it is interesting to note that the language development of first language Irish speakers is often neglected when compared to those who learn it as a second language. For example Hickey (2002) noted that in 'naíonraí' (Irish-speaking preschools), children from Irish-only homes only speak Irish in about 50% of their utterances, and so she recommends that specific language plans, syllabi and methodology be in place in these preschools to continue to foster these children's knowledge of Irish. She holds that young native speakers of a minority language need the kind of language enrichment that is thought necessary for majority language children from disadvantaged homes. Otherwise, she warns that children will have incomplete competence in their mother tongue, particularly as they are vulnerable to the influence and social status of English, which reaches them through television, cinema and community (Baker & Jones, 1998, as cited in Hickey, 2002; see Gathercole & Thomas, 2009). Having an assessment such as the ICDI can be used as a tool (1) to monitor the language acquisition of Irish speakers, (2) to guide the language plans that are needed to ensure that language attrition does not occur, and (3) to ensure that equitable services are provided to bilingual children. As professionals working with bilingual populations have a role to play in maintaining the cultural integrity of children and their families (Ó Murchú, 2001), the development of appropriate assessments and service delivery models needs to continue to be highlighted.

References

Barrena, A., Ezeizabarrena, M. J., & Garcia, I. (2008). Influence of the linguistic environment on the development of the lexicon and grammar of Basque bilingual children. In C. Pérez-Vidal, M. Juan-Garau & A. Bel (Eds.), *A portrait of young in the new multilingual Spain* (pp. 86-110). Clevedon: Multilingual Matters.

Bates, E., Dale, P., & Thal, D. (1995). Individual differences and their implications for theories of language development. In P. Fletcher & B. MacWhinney (Eds.), *The handbook of child language* (pp. 96-151). London: Blackwell.

Bleses, D., Vach, W., Slott, M., Wehberg, S., Thomsen, P., Madsen, T., & Basboll, H. (2008). Early vocabulary in Danish and other languages: A CDI-based comparison. *Journal of Child Language, 35*, 619-650.

Bornstein, M., & Haynes, M. (1998). Vocabulary competence in early childhood: Measurement, latent construct and predictive validity. *Child Development, 69*(3), 654-671.

Brennan, S. (2004). Na chéad chéimeanna: Luathfhorbairt Gaeilge mar phríomhtheanga: Díriú ar an bhfóineolaíocht. Baile Átha Cliath: Comhdháil Náisiúnta na Gaeilge/Western Health Board.

Caselli, M. C., Casadio, P., & Bates, E. (2001). Lexical Development in English and Italian. In M. Tomasello (Ed.), *Language Development: Essential readings in developmental psychology*. London: Blackwell Publishers.

Central Statistics Office. (2012). Census 2011 Profile 9 What We Know - Education, skills and the Irish language. Retrieved 20th April 2011 http://www.cso.ie/en/census/census2011reports/census2011profile9whatweknow-educationskillsandtheirishlanguage/

Dale, P. (1991). The validity of a parent report measures of vocabulary and syntax at 24 months. *Journal of Speech and Hearing Research 34*, 565-571.

Dale, P., Bates, E., Reznick, S., & Morrisset, C. (1989). The validity of a parent report instrument of child language at twenty months. *Journal of Child Language, 16*, 239-249.

Dale, P., & Goodman, J. C. (2005). Commonality and individual differences in vocabulary growth. In M. Tomasello & D. Slobin (Eds.), *Beyond nature-nurture: Essays in honour of Elizabeth Bates* (pp. 41-81). Mahway, NJ: Lawrence Erlbaum Associates

De Houwer, A. (1995). Bilingual language acquisition. In P. Fletcher & B. MacWhinney (Eds.), *The handbook of child language* (pp. 220-250). Oxford: Blackwell.

De Houwer, A. (2009). *Bilingual first language acquisition*. Bristol Multilingual Matters.

De Houwer, A. (2010). Assessing lexical development in bilingual first language acquisition: What can we learn from monolingual norms? In M. Cruz (Ed.), *Multilingual Norms* (pp. 279--322). Frankfurt: Peter Lang.

De Houwer, A., Bornstein, M., & De Coster, S. (2006). Early understanding of two words for the same thing: A CDI study of lexical comprehension in infant bilinguals *International Journal of Bilingualism, 10*(3), 331-347.

Department of Community Rural and Gaeltacht Affairs. (2003). *The Official Languages Act*. Retrieved from http://www.pobail.ie/en/IrishLanguage/OfficialLanguagesAct2003/.

Department of Education and Science. (2007). *Criteria for Enrolment in Special Classes for Pupils with Specific Speech and Language Disorder*. Athlone:: DES, Special Education Section.

Deuchar, M. (2008, 24th -26th October). *Evaluating competing models of code-switching.* Paper presented at the Models of Interaction in Bilinguals, Bangor, Wales

Dionne, G., Dale, P. S., Boivin, M., & Plomin, R. (2003). Genetic evidence for bidirectional effects of early lexical and grammatical development. *Child Development, 74*, 394-412.

Edwards, J. (2004). Foundations of Bilingualism. In T. K. Bhatia & W. C. Richie (Eds.), *The Handbook of Bilingualism* (pp. 7-31). Oxford: Blackwell.

Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S., & Bates, E. (2007). *MacArthur-Bates Communicative Development Inventories (CDIs), User's guide and technical manual* (2nd ed.). Baltimore: Brooks Publishing.

Gathercole, V. C. M. (2010). Bilingual children: Language and assessment issues for educators. In C. Wood, K. Littleton & J. K. Staarman (Eds.), *Handbook of Educational Psychology* (pp. 715-749). London: Elsevier

Gathercole, V. C. M., Thomas, E., & Hughes, E. (2008). Designing a normed receptive vocabulary test for bilingual populations: A model from Welsh. *Bilingual Education and Bilingualism, 11*(6), 678-720.

Gathercole, V. C. M., & Thomas, E. M. (2009). Bilingual first-language development: Dominant language takeover, threatened minority language take-up. *Bilingualism: Language and Cognition, 12*, 213-237.

Gatt, D., Letts, C., & Klee, T. (2008). Lexical mixing in the early productive vocabularies of Maltese children: Implications for intervention *Clinical Linguistics and Phonetics, 22*(4-5), 267-274.

Genesee, F. (2006). Bilingual first language acquisition in perspective. In P. McCardle & E. Hoff (Eds.), *Childhood bilingualism: Research on infancy through school age* (pp. 45-68). Toronto: Multilingual Matters.

Grosjean, F. (2004). Studying Bilinguals: Methodological and conceptual issues. In T. K. Bhatia & W. C. Richie (Eds.), *The Handbook of Bilingualism* (pp. 32-63). Oxford: Blackwell.

Gutierrez-Clellen, V. (1996). Language diversity: Implications for assessment In K. N. Cole, P. S. Dale & D. J. Thal (Eds.), *Assessment of communication and language* (pp. 29-56). Baltimore: Paul H. Brooks.

Hickey, T. (2002). *Language contact in the minority language immersion preschool.* Paper presented at the 2nd International Symposium on Bilinguals, Vigo, Spain.

Hoff, E., Core, C., Place, S., Rumiche, R., Senor, M., & Parra, M. (2012). Dual language exposure and early bilingual development. *Journal of Child Language, 39*, 1-27.

Horwitz, S. M., Irwin, J. R., Briggs-Gowan, M. J., Bosson-Heena, J. M., Mendoza, J., & Carter, A. S. (2003). Language delay in a community cohort of young children *Journal of the Amercian Academy of Child and Adolescent Psychiatry, 42*, 932-940.

Junker, D. A., & Stockman, I. J. (2002). Expressive Vocabulary of German-English Bilingual Toddlers *American Journal of Speech-Language Pathology, 11*, 381-394

MacWhinney, B. (2003). Child Language Analyses (CLAN) (Version 23). Mahway, NJ: Lawrence Erlbaum Associates. Retrieved from http://childes.psy.cmu.edu/

Marchman, V. A., & Martínez-Sussmann, C. (2002). Concurrent validity of caregiver/parent report measures of language for children who are learning both English and Spanish. *Journal of Speech, Language and Hearing Research, 45*, 983-997.

Marchman, V. A., Martínez-Sussmann, C., & Dale, P. S. (2004). The language-specific nature of grammatical development: Evidence from bilingual language learners. *Developmental Sciences 7*(2), 212-224.

O'Toole, C., & Fletcher, P. (2008). Developing assessment tools for bilingual and minority language acquisition. *Journal of Clinical Speech and Language Studies, 16*, 12-27.

O'Toole, C., & Fletcher, P. (2010). Validity of a parent report for Irish speaking toddlers. *First Language, 30*(3), 199.

O'Toole, C., & Hickey, T. (2013). Diagnosing language impairment in bilinguals: Professional experience and perception. *Child Language Teaching & Therapy, 29*(1), 91-109

Ó Murchú, H. (2001). The needs of Irish-speaking bilinguals. *Journal of Clinical Speech and Language Studies, 11*(40-68).

Owen, A., & Leonard, L. (2002). Lexical diversity in the spontaneous speech of children with Specific Language Impairment: Application of D. *Journal of Speech, Language and Hearing Research, 45*, 927-937.

Patterson, J. L. (2000). Observed and reported vocabulary and word combinations in bilingual toddlers. *Journal of Speech, Language and Hearing Research, 43*, 121-128.

Patterson, J. L., & Pearson, B. Z. (2004). Bilingual lexical development: Influences, contexts, and processes. In B. Goldstein (Ed.), *Bilingual language development and disorders in Spanish-English speakers* (pp. 77-104). Baltimore: Paul Brookes.

Pearson, B. Z., Fernandez, S., Lewedag, V., & Oller, D. K. (1997). Input factors in lexical learning of bilingual infants (ages 10 to 30 months). . *Applied Psycholinguistics, 18*, 41048.

Pearson, B. Z., Fernández, S. C., & Oller, D. K. (1993). Lexical development in bilingual infants and toddlers: Comparison to monolingual norms. *Language Learning, 43*(1), 93-120.

Pérez-Pereira, M. (2008). Early Galician-Spanish bilingualism: Contrasts with monolingualism. In C. Pérez-Vidal, M. Juan-Garau & A. Bel (Eds.), *A portrait of the young in the new multilingual Spain* (pp. 39-62). Clevedon: Multilingual Matters.

Pert, S., & Letts, C. (2001). Developing an expressive language assessment for children in Rochdale with a Pakistani heritage background. *Child Language Teaching and Therapy, 19*, 268-289.

Price, T. S., Eley, T. C., Dale , P. S., Stevenson, J., Saudino, K., & Plomin, R. (2000). Genetic and environmental covariation between verbal and nonverbal cognitive development in infancy. *Child Development, 71*, 948-959.

Quay, S. (2008). Dinner conversations with a trilingual two-year-old: Language socialization in a multilingual context. *First Language, 28*, 5-33.

Rescorla, L., & Achenback, T. M. (2002). Use of the Language Development Survey (LDS) in a national probability sample of children 18 to 35 months old. *Journal of Speech, Language and Hearing Research, 45*, 733-743.

Richards, B. J., & Malvern, D. D. (1997). *Quantifying lexical diversity in the study of language development.* Reading: University of Reading, The New Bulmershe Papers.

Royal College of Speech and Language Therapists. (2006). *Communicating Quality 3* London: RCSLT.

Slobin, D. (2002). Cross-Linguistic Comparative Approaches to Language Acquisition. In K. Brown (Ed.), *Encyclopaedia of Language and Linguistics.* (pp. 299-301). London: Elsevier.

Stokes, S. F., & Klee, T. (2009). Factors that influence vocabulary development in two-year-old children. *Journal of Child Psychology and Psychiatry, 50* (4), 498-505.

Thordardottir, E., Rothenbert, A., Rivard, M., & Naves, R. (2006). Bilingual assessment: Can overall proficiency be estimated from separate measurement of two languages? . *Journal of Multilingual Communication Disorders, 4*(1), 1-21.

van Agt, H. M. E., van der Stege, H. A., de Ridder-Sluiter, H., Verhoeven, L. T. W., & de Koning, J. K. (2007). A cluster randomised trail of screening for language delay in toddlers: Effects on school performance and language development at age 8. *Pediatrics, 120*, 1317-1325.