Expressive and receptive language skills in preschool children from a socially disadvantaged area.

Ryan, A., Gibbon, F.E., O'Shea, A.

Abstract

Purpose: Evidence suggests that children present with receptive language skills that are equivalent to or more advanced than expressive language skills. This profile holds true for typical and delayed language development. This study aimed to determine if such a profile existed for preschool children from an area of social deprivation and to investigate if particular language skills influence any differences found between expressive and receptive skills.

Method: Data from 187 CELF P2 UK assessments conducted on preschool children from two socially disadvantaged areas in a city in southern Ireland.

*Results:*A significant difference was found between Receptive Language Index (RLI) and Expressive Language Index (ELI) scores with Receptive scores found to be lower than Expressive scores. The majority (78.6%) of participants had a lower Receptive Language than Expressive score (RLI<ELI), 18.2% of participants had a higher Receptive score than score (RLI>ELI) with very few (3.2%) having the same Receptive and Expressive scores (RLI=ELI). Scores for the Concepts and Following Directions (receptive) subtest were significantly lower than for the other receptive subtests while scores for the Expressive Vocabulary subtest were significantly higher than for the other expressive subtests.

Conclusion: The finding of more advanced expressive than receptive language skills in socially deprived preschool children is previously unreported and clinically relevant for speech-language pathologists in identifying the needs of this population.

KEYWORDS: CELF P2; Expressive language; preschool aged children; receptive language; social disadvantage

Introduction

Research suggests that receptive language precedes expressive language in infancy and early childhood (Benedict, 1979; Gershkoff-Stowe & Hahn, 2013; Goldin-Meadow, Seligman & Gelman,1976) and that the two domains become relatively equal in preschool and early primary school children based on performance on standardised assessments (Edwards, Letts & Sinka, 2011; Wiig, Secord & Semel, 2004). Some exceptions have been documented with production being superior to comprehension when children are assessed on the use of certain grammatical structures (Chapman & Miller, 1975; Hurewitz, Browne-Schmidt, Thorpe, Gleitman & Trueswell, 2000; Matthews, Lieven, Theakston & Tomasello, 2009; McClellan, Yewchuk & Holdgrafer, 1986).

Information regarding the development of receptive and expressive language in relation to one another is important for clinicians working with children at risk of language delay. Children living in areas of social deprivation are at a particularly high risk of language difficulties. Associations between social deprivation, poor language skills and poor educational achievement have been well established (Arriaga, Fenson, Cronan & Pethick, 1998; Walker, Greenwood, Hart & Carta, 1994). This population have been found to perform significantly below the level of the non-disadvantaged population in formal language assessments (Law, McBean & Rush, 2011; Letts, Edwards, Sinka, Schaefer & Gibbons, 2013; Locke, Ginsborg & Peers, 2002). However there has been no direct comparison of receptive and expressive skills in these children. Such comparisons are necessary to improve clinical knowledge of how language develops within disadvantaged populations and to inform prioritisation of assessment and intervention goals.

Clark (1995) stated that comprehension and production develop asymmetrically and that "comprehension must precede production" (p.246) in order for the speaker to know which word to use to convey a particular meaning. This has been supported by a variety of studies. Goldin-Meadow et al. (1976) found that children aged 1:2–2:2 years from a middle class background understood more words than they could produce when assessed on knowledge of 100 words. Benedict (1979) found that comprehension not only develops before production but also develops much more rapidly than production based on data collected longitudinally from children aged 0:9- 2:0 years. Gershkoff-Stowe and Hahn (2013) found a lexical gap between comprehension and production in children from a middle class background aged 2:0 years where nearly half of the words correctly identified in comprehension failed to be produced. The standardisation samples extracted from the

manuals of assessments such as the Clinical Evaluation of Language Fundamentals Preschool 2nd edition UK (CELF P2 UK) (Wig et al., 2004) and the New Reynell Developmental Language Scales (NRDLS) (Edwards et al., 2011) indicate that receptive and expressive skills are relatively equal with a slight trend towards higher receptive language scores.

Despite the trend of receptive preceding expressive skills there is evidence of production exceeding comprehension in specific areas of syntactic development. Studies such as Matthews et al. (2009) found that production of third person pronouns was correct in children aged 4:3-6:9 years while errors in comprehension of these pronouns remained. Chapman and Miller (1975) found that children aged 1:8-2:8 years were able to describe simple actions but had difficulty acting out similar actions in a parallel comprehension task, indicating that production of subject-verb-object sentences may precede their comprehension. This study was replicated by McClellan et al. (1986) with children aged 2:2 –2:10 years and a similar profile of results was found. More recently, Hurewitz et al. (2000) found that children aged 3:0-4:0 years from metropolitan areas were able to produce sentences with relative clauses but often misinterpreted such sentences when they were presented in a receptive task. These studies provide specific examples of where expressive abilities may precede receptive abilities in language development. The age ranges examined indicate that this asymmetry persists from infancy throughout early childhood. In summary the evidence indicates that lexical comprehension exceeds expression in very early childhood while production of specific syntactic structures may exceed comprehension throughout early childhood. Despite these specific asymmetries, when assessed using standardised assessment tools, children in the general population demonstrate relatively similar skills in receptive and expressive domains with any slight asymmetry in favour of superior receptive skills.

Asymmetries between production and comprehension may characterise specific clinical groups. In a series of studies by Leonard, Schwartz and colleagues, comparisons between children aged 3:0-4:0 years with specific language impairment (SLI) and younger typically developing children found that comprehension abilities exceeded production abilities in both groups (Leonard, Schwartz, Chapman, Rowan, Prelock, Terrell, et al., 1982; Leonard, Schwartz, Allen, Swanson & Loeb, 1989; Leonard, Schwartz, Swanson & Loeb, 1987; Schwartz, 1988; Schwartz, Leonard, Messick & Chapman, 1987). Dollaghan (1987) found that children with SLI had impaired production abilities in the presence of intact comprehension skills when compared with typically developing children of the same age. The DSM-IV classification of SLI recognises that some children may have difficulty primarily in the area of expressive language with superior comprehension skills whereas

others may have significant limitations in both receptive and expressive language (American Psychiatric Association, 1994). In contrast, children with autism have been found to have greater deficits in receptive rather than expressive language in vocabulary development (Charman, Drew, Baird & Baird, 2003b; Fenson, Dale, Reznick, Bates, Thal & Pethnick, 1994; Luyster, Kadlec, Carter & Tager-Flusberg, 2008). Hudry, Leadbitter, Temple, Slonims, McConachie, Aldred, et al. (2010) assessed 152 preschool children with autism and found that while they were impaired in both receptive and expressive language, comprehension skills were more impaired than production skills based on both direct assessment and parent report across the different areas of language e.g., semantics, syntax, vocabulary. It is unlikely that these findings are attributable to deficits in attention as Noterdaeme, Amorosa, Mildenberger, Sitter and Minow (2001) reported that children with autism perform comparably with typically developing children on tests of sustained and selective attention in both auditory and visual modalities. Tager-Flusberg, Paul and Lord (2005) have highlighted possible explanations for this atypical profile of language development suggesting that impairments in symbolic play are strongly related to receptive language based on the findings of a study by Ungerer and Sigman (1981) and that children with autism may experience difficulty in applying knowledge about the probabilities of occurrence of events in the world to comprehension of sentences. They also suggested that a difficulty with understanding nonverbal cues and determining the intention of the speaker may contribute to comprehension difficulties in everyday situations.

The relationship between receptive and expressive language is of particular relevance in children from disadvantaged areas that are associated with measures of low socioeconomic status (SES). This population requires particular attention because there is now strong evidence that these children experience a higher prevalence of language difficulties. Locke et al. (2002) compared the language skills of socially disadvantaged children aged 3:0-4:3 years with children in the typically developing population using the CELF Preschool (Wiig, Secord & Semel, 1992). Children with low SES scored significantly lower than the general population, with 55.6% having some level of language delay. In a similar study, Law et al. (2011) assessed older children aged 5:0-12:0 years from a socially disadvantaged area using the CELF 4 (Semel, Wiig & Secord, 2006). In their sample of 138 children, 39.9% had some level of language delay. However, the study by Law et al. (2011) included children with cognitive and language impairment which may have increased the prevalence of language delay found within the group. Letts et al. (2013) reported an association between maternal education, an indicator of SES, and scores on the NRDLS (Edwards, Letts & Sinka, 2011).

They found that about a third of children aged 2:0-5:6 years with minimum years of maternal education had some level of language delay but did not find a strong association between SES and language delay. Peers, Lloyd and Foster (2000) found that children from low SES backgrounds were twice as likely to experience receptive language delay and five times more likely to experience expressive language delay when compared with children from middle or high SES backgrounds suggesting that receptive skills were less susceptible to the effects of social deprivation.

It is evident from the literature that children from low SES backgrounds are at risk of having lower language scores than those from more privileged backgrounds. This may be due to particular social, economic or environmental factors and the influence of these factors may vary depending on the child's age and the particular language skill being assessed. However receptive skills relative to expressive skills in children during the preschool period have not been investigated in this population. This information is important in determining whether language develops differently in children from socially disadvantaged areas. If so, in what way is the profile of receptive and expressive language development different from what we would expect to see in children from more privileged backgrounds? This study aims to address this gap in the literature by answering the following questions:

1. Is there a significant difference in the receptive and expressive language skills of children aged between 3:0 and 5:0 years living in an area of social disadvantage?

2. If so, what is the direction of this difference? Are there specific skills within receptive and expressive language that influence this difference?

Method

Population Demographics/Background Information

This study was conducted in conjunction with the Happy Talk Project which aimed to improve language and learning skills of preschool children in two socially disadvantaged areas in a city in southern Ireland. As part of the project a team of speech-language pathologists provided assessments and referrals to junior infants and preschool children as well as coaching and training for staff and parents. The areas are designated RAPID areas (Revitalising Areas by Planning, Investment and Development) and represent communities experiencing disadvantage as identified by a number of specific measurements. They are considered unemployment black spots with the most recent Census in 2011 reporting

unemployment rates of 41.2% in one of the areas and 39.1% in the other (Central Statistics Office, 2012) This is more than three times the national average of 11.8%.(Central Statistics Office, 2014). The percentage of children in the 15+ age group who completed lower secondary school education was reported to be 23.0% and 28.6% for each of the areas respectively. Single parent rates were reported as 50% and 61% respectively for the two areas (O'Donovan, 2009). In a baseline report for the city, deprivation was measured using the composition of a demographic profile, social class composition and labour market situation to form a deprivation index with scores range from -50 (most disadvantaged) to + 50 (most affluent). In 2011, the Relative Deprivation Index Score for each of the areas was -16.6 and -14.5 respectively indicating a classification of "Disadvantaged" (Haase & Pratschke, 2012).

Criteria for inclusion of schools in the Happy Talk Project were; (a) identified by the Irish Department of Education and Skills as a (Delivering Equality of Opportunity in Schools) DEIS school; (b) Preschools attached to DEIS schools; and (c) Community preschools part of an Early Years Network. DEIS refers to the Action Plan for Educational Inclusion, "this action plan focuses on addressing the educational needs of children and young people from disadvantaged communities, from preschool through second-level education (3 to18 years)" (The Department of Education and Science, 2005, p.7).

Participants

There were 187 participants aged 3:0-4:11 years analysed in the current study. The majority of participants (92.5%) were white. This included 96 females (51%) and 91 males (49%). The children attended five primary schools and 14 preschools serving disadvantaged communities within the city. The participants were in preschool or Junior Infants classes. Junior Infants is the first year of primary school in southern Ireland and the typical age for beginning primary school is 5 years. However 40% of 4 year olds in southern Ireland attend primary school (Department of Education and Skills, 2014). While it is important to state that the participants were drawn from both preschool and primary schools, for the purposes of this study and due to the age of the children, the participants in the current study will be referred to as "preschool". Participants were recruited from the school register. Starting with child #1 on the register of each class, then every second child e.g., #3, #5,#7, was assessed. When the end of the register was reached, every second child e.g., #2, #4, #6 was assessed until 60% of children from the class had been assessed. If a child was absent, or if English was not the only language spoken in the child's home, the next child on the register was assessed. As such, "English not only language" or "inability to access results" were the only exclusionary

criterion. If a child had been assessed using the CELF P2 UK by another service in the previous six months (due to concerns regarding delayed language development) permission to use these results was requested from parents/guardians and the service. In all cases the age at the time of testing was recorded. Consent for participation in all assessment and intervention carried out as part of the Happy Talk Project was obtained from parents at the beginning of each school year in the form of an information sheet and opt out form.

CELF P2 UK

CELF P2 UK assessments were conducted by two speech-language pathologists with over three years' experience in the assessment and intervention of children with communication difficulties. The scores reported in this study were obtained at baseline for all participants prior to language intervention. The CELF P2 UK is one of the most widely used standardised assessments of language abilities in preschool children (Teoh, Brebner & McCormack, 2012). It provides information on a child's strengths and needs in receptive and expressive modalities by providing an index score for receptive and expressive language. The Receptive Language Index score is a cumulative measure of a child's performance on Sentence Structure, Concepts and Following Directions and Basic Concepts. Sentence Structure assesses the ability to understand spoken sentences of increasing length and complexity. Concepts and Following Directions assesses the ability to understand spoken directions containing concepts that require logical operations, to remember the names, orders and characteristics of items mentioned and to identify the target from among several choices. Basic Concepts assesses knowledge of size, position, quantity and equality. Similarly the Expressive Language Index score is a cumulative measure of performance on Word Structure, Expressive Vocabulary and Recalling Sentences. Word structure assesses the ability to apply grammatical markers and to select and use referential pronouns appropriately. Expressive Vocabulary assesses referential naming. Recalling Sentences assesses the ability to listen to and repeat sentences of increasing length and complexity.

The CELF P2 UK was assessed for reliability using Cronbach's coefficient alpha for which 0.7 is generally considered an acceptable level of reliability. Coefficients for all index and subtest scores exceeded this marker and are provided for each age group in the CELF P2 UK manual (Wiig et al., 2004). As part of the sampling procedure for this assessment, efforts were made to obtain the proportion of children of parents from each educational level as proportionate to the distribution of these levels within the population at large. As such children who might be classified as disadvantaged based on level of parental education are

represented within the standardisation sample but their scores have not been disaggregated to allow for comparisons between educational levels (Wiig et al., 2004).

Analysis of Index Scores

Two analyses were conducted on index scores. First, the percentage of children with higher Expressive Index scores (RLI<ELI), higher Receptive Index scores (RLI>ELI) and equal Index scores (RLI=ELI) was determined. Second, the number of participants with a significant difference between their Receptive and Expressive Index scores was calculated using the method outlined in the CELF P2 UK manual (p.76). This provides critical values for comparing the index scores for each participant. According to the manual "when the difference between the two index scores is greater than or equal to the listed critical value…the difference is…a true difference rather than due to measurement error or random fluctuation" (Wiig et al., 2004, p.76). Critical values at the 0.05 level of significance were used for the different age groups (3:0-3:5 years, 3:6-3:11 years, 4:0-4:5 years, 4:6-4:11 years). The data for Receptive and Expressive Index Scores was examined for normal distribution and homogeneity of variance using measures of central tendency and measures of dispersion. Parametric assumptions were satisfied and a paired sample t-test was carried out to establish whether or not a significant difference existed between Receptive and Expressive Index Scores.

Analysis of Subtests

Data for the receptive and expressive subtests respectively were examined using the Shapiro-Wilks Test of Normality, none had normal distribution ($p<0.001$) therefore parametric assumptions were not supported. The non-parametric Friedman One-Way ANOVA was used to detect significant differences between scores for the receptive subtests and between scores for expressive subtests respectively. A Wilcoxon matched pairs t- test was then used to compare each receptive subtest against the other and each expressive subtest against the other to determine where significant differences occurred. A Bonferroni correction was applied such that a significant difference in scores would be determined by a significance level of $p<0.017$.

Analysis of Language Delayed vs. Typically Developing Language Group

The participants were divided into those with typical language and those with a receptive and/or expressive language delay based on guidelines in the CELF P2 UK manual

(Wiig et al., 2004, p.75). Receptive and Expressive Index scores were examined for each participant. Participants with a score of 86+ on both index scores were assigned to the typically developing language group. Participants with a score of 85 (1 SD below the mean) or lower on either of the index scores were assigned to the language delayed group. Participants in the language delayed group were assigned a severity rating based on the guidelines in the assessment manual (Wiig et al., 2004, p.75). The cut-off point of 1 SD below the mean to determine the presence of language delay is in line with methods used by other studies investigating language abilities in this population (Locke et al, 2002; Law et al, 2011; Law et al, 2013). The number of participants in each group who had a significant difference between their Index scores was determined and the statistical procedures outlined above were repeated with these two groups respectively.

Results

Index Scores

The analysis showed that 78.6% of participants had a lower Receptive Language Index score than Expressive Language Index score (RLI<ELI), 18.2% of participants had a higher Receptive Language Index score than Expressive Language Index score (RLI>ELI) and 3.2% had the same Receptive and Expressive Language Index score (RLI=ELI). Figure 1 contrasts these percentages with those provided for the CELF P2 UK standardisation sample (45.5% RLI<ELI; 49.5% RLI>ELI; 5.0% RLI=ELI).

Receptive Language Index scores were found to be significantly lower than Expressive Language Index scores (t (186) =-11.089, p<0.001) in the paired sample t-test. Nearly half of the participants (42.8% , n = 80) were found to have significant differences between their Receptive and Expressive Index scores based on the critical values outlined on the CELF P2 UK manual (Wiig et al., 2004). A small minority (3.2%, n = 6) had a significantly higher Receptive Index score than Expressive Index score, while over a third (39.6%, n = 74) had a significantly higher Expressive Index score (Figure 2).

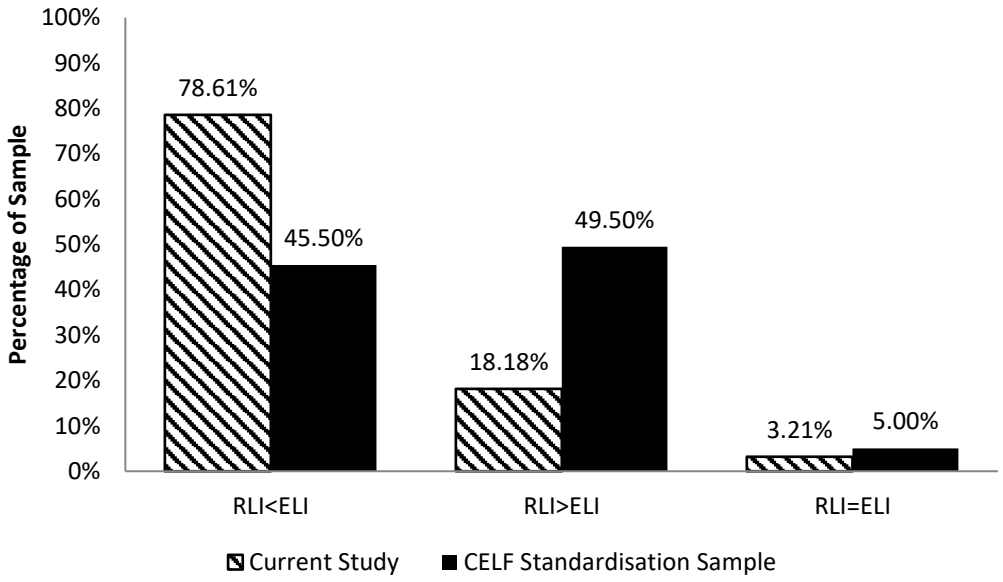

Figure 1. Comparison of the pattern of Receptive Language Index (RLI) and Expressive Language Index (ELI) score differences for participants in the current study and in the CELF P2 UK standardisation sample (Wiig et al., 2004).

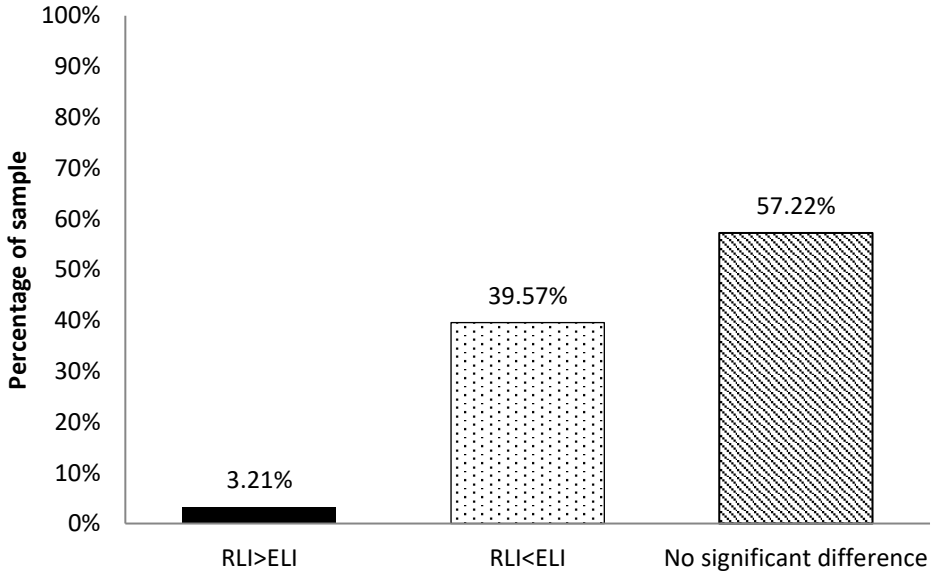

Figure 2. Percentage of participants with significant differences between Receptive Language Index (RLI) scores and Expressive Language Index (ELI) scores and those with no significant difference between scores.

Receptive Subtests

Table 1 shows the mean scores for each of the receptive subtests. A significant difference was found between the participants' scores on the receptive subtests of Sentence Structure, Concepts and Following Directions and Basic Concepts ($X_2(2) = 42.21$, $p<0.001$). Scores for the Sentence Structure subtest were significantly higher than scores for the Concepts and Following Directions subtest ($z= -3.75$, $p<0.001$). Scores for the Basic Concepts subtest were significantly higher than scores for the Sentence Structure subtest ($z=-3.70$, $p<0.001$). Scores for the Basic Concepts subtest were significantly higher than scores for the Concepts and Following Directions subtest ($z=-6.99$, $p<0.001$).

Expressive Subtests

A significant difference was found between the participants' scores on the expressive subtests of Word Structure, Expressive Vocabulary and Recalling Sentences ($X_2(2) = 18.51$, $p<0.001$). Scores for the Word Structure Subtest were significantly lower than scores for the Expressive Vocabulary subtest ($z=-3.16$, $p<0.01$). There was no significant difference between the scores on the Word Structure subtest and the Recalling Sentences subtest ($z=-1.74$, $p>0.05$). Scores for the Expressive Vocabulary subtest were significantly higher than scores for the Recalling Sentences subtest ($z=-4.47$, $p<0.001$). Table 1 shows the mean scores for each of the expressive subtests.

Table 1. Means and SD with 95% confidence intervals for whole group and for language delayed and typically developing language groups.

	Typical Language Development Group n=130	Language Delayed Group n=57	Whole Sample n=187
Index/Subtest Score (SD)	**M**	**M**	**M**
	Age (95% CI)	**Age (95% CI)**	**Age (95% CI)**
RLI (15)	100.99	75.89	93.34
	3:0-3:11 (92.99, 108.99)	3:0-3:11 (67.89, 83.89)	3:0-3:11 (85.34, 101.34)
	4:0-4:11 (93.99, 107.99)	4:0-4:11 (68.89, 82.89)	4:0-4:11 (86.34, 100.34)
ELI (15)	108.31	86.19	101.57
	3:0-3:11 (100.31, 116.31)	3:0-3:11 (78.19, 94.19)	3:0-3:11 (109.57, 93.57)
	4:0-4:11 (101.31, 115.31)	4:0-4:11 (79.19, 93.19)	4:0-4:11 (104.57, 108.57)
SS (3)	10.19	6.00	8.91
	3:0-3:5 (7.19, 13.19)	3:0-3:5 (3.00-9.00)	3:0-3:11 (5.91, 11.91)
	3:6-4:11 (8.19, 12.19)	3:6-4:11(4.00-8.00)	4:0-4:11 (6.91, 10.91)
CFD (3)	9.46	5.33	8.20
	3:0-4:11 (7.46, 11.46)	3:0-4:11 (3.33-7.33)	3:0-4:11 (6.20, 10.20)
BC (3)	11.12	6.14	9.60
	3:0-3:5/4:0-4:5 (9.12,13.12)	3:0-3:5/4:0-4:5 (4.14, 8.14)	3:0-3:5/4:0-4:5 (7.60, 11.60)

	3:6-3:11/4:6-4:11 (8.12,14.12)	3:6-3:11/4:6-4:11 (3.14, 9.14)	3:6-3:11/4:6-4:11 (6.60, 12.60)
WS (3)	11.48 3:0-4:11 (9.48, 13.48)	7.32 3:0-4:11 (5.32, 9.32)	10.21 3:0-4:11 (8.21, 12.21)
EV (3)	12.05 3:0-3:11 (9.05, 15.05) 4:0-4:11 (10.05, 14.05)	7.98 3:0-3:11 (4.98-10.98) 4:0-4:11 (5.98, 9.98)	10.81 3:0-3:11 (7.81, 13.81) 4:0-4:11 (8.81, 12.81)
RS (3)	10.89 3:0-3:11 (8.89, 12.89) 4:0-4:11 (9.89, 11.89)	7.58 3:0-3:11 (5.58, 9.58) 4:0-4:11 (6.58, 8.58)	9.88 3:0-3:11 (7.88, 11.88) 4:0-4:11 (8.88, 10.88)

Typically Developing Language Group vs. Language Delayed Group

Following analysis, 57 participants (30.5%) were assigned to the language delayed group, leaving 130 participants (69.5%) in the typically developing language group. Table 2 summarises the type and severity of delays present in the language delayed group. 49.1% had a receptive delay only, 5.3% had an expressive delay only and 45.6% had a mixed receptive and expressive delay. Of those with a mixed delay, 12 participants (46.2%) were equally delayed in receptive and expressive language, nine participants (34.6%) were more delayed receptively than expressively and five participants (19.2%) were more delayed expressively than receptively.

Language Delayed Group – Index Scores and Receptive and Expressive Subtests

Results indicated that 30.5% of participants had a language delay. This figure is somewhat lower than the estimates of 40-50% provided by previous studies for similar populations (Locke et al, 2002; Law et al, 2011; Law et al, 2013) but nevertheless indicates that the prevalence of language difficulties in preschool children from areas of social deprivation is higher than the prevalence of 2-19% reported in the general population (Law, Boyle, Harris, Harkness & Nye, 1998; Rescorla, Hadicke-Wiley & Escarce, 1993; Silva, McGee & Williams, 1983; Stevenson & Richman, 1976 & Wong, Lee, Lieh-Mak, Yeung, Luk & Yiu, 1992).

Table 2. Types and severity of language delay.

Receptive Delay Only		Expressive Delay Only		Mixed Receptive and Expressive Delay			
28		3		26			
				Receptive		Expressive	
Severity	*n*	Severity	*n*	Severity	*n*	Severity	*n*
Mild	17	Mild	1	Mild	8	Mild	14
Moderate	8	Moderate	0	Moderate	10	Moderate	5
Severe	3	Severe	2	Severe	8	Severe	7

It was found that 34 participants (59.7%) in the language delayed group had a significant difference between their Receptive and Expressive Index scores, 5 (8.8%) had a

higher Receptive Index Score while the remaining 29 (50.9%) had a higher Expressive Index Score. Receptive Index scores were found to be significantly lower than Expressive Index scores (t (56) =-5.913, p<0.001) for this group. There were no significant differences between the participants' scores on the receptive subtests ($X_2(2) = 1.916$, p>0.05) or between participants scores on the expressive subtests ($X_2(2) = 1.600$, p>0.05) in the language delayed group.

Typical Language Development Group-Index Scores and Receptive and Expressive Subtests

It was found that 46 participants (35.4%) in the typical language development group had a significant difference between their Receptive and Expressive Index scores. One of these had a higher Receptive Index score; all other participants had a higher Expressive Index score. Receptive Index scores were found to be significantly lower than Expressive Index scores (t (129) = -9.932, p<0.001) for the typical language development group.

A significant difference was found between scores on receptive subtests ($X_2(2) = 51.983$, p<0.001) in this group. Scores for the Sentence Structure subtest were significantly higher than scores for the Concepts and Following Directions subtest (z= -3.73, p<0.001). Scores for the Basic Concepts subtest were significantly higher than scores for the Sentence Structure subtest (z=-4.08, p<0.001). Scores for the Basic Concepts subtest were significantly higher than scores for the Concepts and Following Directions subtest (z=-6.91, p<0.001).

A significant difference was also found between the expressive subtests ($X_2(2) = 20.52$, p<0.001) for this group. Scores for the Word Structure Subtest were significantly lower than scores for the Expressive Vocabulary subtest (z=-2.81, p<0.01). Scores for the Word Structure subtest were significantly higher than scores for the Recalling Sentences subtest (z=-2.65, p<0.01). Scores for the Expressive Vocabulary subtest were significantly higher than scores for the Recalling Sentences subtest (z=-4.74, p<0.001).

Table 3 provides a summary of the performance of the group as a whole, the language delayed group and the typical language development group when comparing Receptive and Expressive Index scores and when comparing receptive and expressive subtests respectively.

Table 3. Summary of differences between index and subtest scores for whole group and for language delayed and typically developing language groups.

	Total Participants (*n*=187)	Language Delayed Participants (*n*=57)	Typical Language Development Participants (*n*=130)
Index Scores			
Significant differences between individual index scores (0.05 level of significance)	80 (42.78%)	34 (59.65%)	46 (35.38%)
RLI significantly greater than ELI	6 (3.21%)	5 (8.77%)	1 (0.77%)
ELI significantly greater than RLI	74 (39.57%)	29 (50.88%)	45 (34.62%)
Significant difference between group index scores (paired sample t-test)	RLI<ELI*	RLI<ELI*	RLI<ELI*
Receptive Subtests			
SS vs CFD	SS>CFD*	NSD	SS>CFD*
SS vs BC	SS<BC*	NSD	SS<BC*
CFD vs BC	CFD<BC*	NSD	CFD<BC*
Expressive Subtests			
WS vs EV	WS<EV†	NSD	WS<EV†
WS vs RS	NSD	NSD	WS>RS†
EV vs RS	EV>RS*	NSD	EV>RS*

Note. RLI= Receptive Language Index Score; ELI= Expressive Language Index Score; SS= Sentence Structure; CFD= Concepts and Following Directions; BC= Basic Concepts; WS= Word Structure; EV= Expressive Vocabulary; RS= Recalling Sentences; NSD= No Significant Difference; * = $p<0.001$; †= $p<0.01$.

Discussion

This study aimed to determine if a significant difference exists between receptive and expressive language skills in preschool children from a socially disadvantaged area and if so what specific areas within the two domains influence any differences found. The results showed that there was a significant difference between Receptive and Expressive Language Index scores such that Expressive Index scores were significantly higher than Receptive Index scores. The majority (78.6%) of children had a higher Expressive score, with fewer (18.2%) having a higher Receptive score, and only a small minority (3.2%) of participants showing no difference between their Index scores. The overall profile of more advanced expressive than receptive skills is supported by analysis, using critical values and guidelines from the manual showing that almost 40% of children had significantly higher expressive compared to receptive skills, whereas only 3% had the opposite profile. This language profile differs notably from the profile of index scores reported in the CELF P2 UK manual where it states that "5% of the standardisation sample showed no difference at all, about half…earned higher Expressive Index scores (45.5%), and about half earned higher Receptive Index scores (49.5%)" (Wiig et al., 2004, p.77). Mean scores provided for the NRDLS standardisation sample on the Comprehension (55.79) and Production (45.74) scales indicate a similar profile to the profile reported in the CELF P2 UK manual in that receptive and expressive language abilities are relatively similar with a slight trend towards better receptive skills. Therefore the results of the current study have demonstrated a language profile of stronger expressive compared to receptive skills that has not been reported in the general population when assessed using standardised assessments such as the CELF P2 UK or the NRDLS. The profile of superior expressive compared to receptive language scores is consistent across the group as a whole as well as for the subgroups of language delay and typical language. More severe difficulties with receptive compared to expressive language is apparent in the language delayed group. The results indicate a consistent and substantial difference between the language modalities in favour of a higher level of expressive skill. Based on a previous review of the literature, this profile is not predicted in either the language delayed or typically developing population.

Possible explanations for superior expressive rather than receptive skills can be postulated based on evidence in the literature examining the effects of SES on language. One such explanation is that the socioeconomic factors at play within this population may have affected receptive language more than expressive language. Previous studies have found evidence to suggest that socioeconomic variables such as parent-child interaction styles, level of maternal education, maternal sensitivity, income-to-needs ratio and environmental and social factors may have a greater influence on receptive rather than expressive language. Bee, Barnard, Eyres, Gray, Hammond, Spietz, et al. (1982) used a variety of measures to determine what factors predict IQ and language status and found a consistent profile of stronger predictions for receptive rather than expressive language. In particular, the mother's perception of her social support and the mother's developmental expectations were found to be strongly related to receptive language development. Murray and Hornbaker (1997) found that a facilitative interaction style positively predicted receptive language and cognitive status while a directive style was negatively related to receptive language development. Expressive language was not predicted by child variables or maternal style of interaction. Raviv, Kessenich and Morrison (2004) reported that maternal education and income-to-needs ratio were significantly associated with both expressive and receptive language on the Reynell Developmental Language Scales (Reynell, 1991) and with receptive knowledge of basic concepts on the Bracken Basic Concept Scale (Bracken, 1984). However the correlation was much stronger for receptive language. For example the correlation between maternal education and verbal comprehension and maternal education and receptive knowledge of basic concepts were much stronger than the correlation between maternal education and expressive language. The amount of predicted variation was much greater for receptive language (32%) than expressive language (13%).

These studies suggest that some socioeconomic variables may have a greater impact on receptive rather than expressive language development. However Letts et al. (2013) found the opposite trend when investigating the relationship between SES quintiles and scores on the NRDLS. A significant relationship was found for production but not for comprehension, the authors did not discuss possible reasons for this finding however. The findings of the current study support the idea that living in a socially deprived area may have a more negative impact on receptive rather than expressive language and highlights the need to further investigate the effect of specific socioeconomic variables on receptive versus expressive language.

Another possible factor influencing the trend of lower receptive language scores is the

age of the participants. It has been suggested that the effects of socioeconomic factors may lessen with increasing age (Letts et al., 2013). Black, Peppe and Gibbon (2008) found no relation between SES and receptive vocabulary for older children but Rowe (2008) found that SES measures were significantly related to receptive vocabulary at the age of 2:6 years. In the current study over 30% of preschool children from an area of social deprivation aged 3:0-4:11years were found to have a language delay and the vast majority had either a mixed or receptive only delay. Based on this evidence it could be hypothesised that receptive language difficulties exist in younger socially deprived children but may not be as significant a factor for older school aged children from such areas.

The secondary aim of this study was to determine what specific areas of language might be influencing the difference found between receptive and expressive skills. Analysis of subtests revealed significantly higher scores in Expressive Vocabulary and significantly lower scores in Concepts and Following Directions. This provides evidence of a direct influence on the difference found between Receptive and Expressive Index scores. A higher score in Expressive Vocabulary than in the other expressive subtests was a consistent finding across the data with the difference being significant for the group as a whole and the typical language development group. Dockrell (2001) and Conti-Ramsden and Durkin (2012) caution against the use of vocabulary scores as indicators of general language ability, "for some children with language impairments vocabulary scores can be well within the norm despite wider problems with receptive and expressive language (Lahey & Edwards, 1995)" (Dockrell, 2001, p.78). Gray, Plante, Vance and Henrichsen (1999) found that vocabulary tests were weak predictors of whether a child's language was typically developing or delayed/disordered. In their sample, children with SLI typically scored within the normal range on vocabulary tests. Therefore a preschool child may present with adequate vocabulary in the presence of semantic and syntactic difficulties making vocabulary a poor indicator of a child's language ability.

The relatively high Expressive Vocabulary scores by the children included in the current study are likely to have contributed to their higher Expressive Index scores, with the possibility that this overestimated their expressive language abilities. Gray et al. (1999) found that, in their sample, a significant proportion (32%) of children with SLI demonstrated a profile of higher expressive rather than receptive scores supporting the idea that when vocabulary scores are used to assess language the result can be an unexpected profile in terms of receptive and expressive skills. It is unclear why expressive vocabulary might be a relative

strength in children with language difficulties. Gray et al. (1999) suggested that vocabulary scores may be misleading when compared expressively and receptively and may vary considerably depending on the test used.

Significant differences were also found between each of the receptive subtests for the group as a whole and for the typical language development group with scores for Concepts and Following Directions being significantly lower than the other two subtests. Poor performance in this subtest may be related to the age and SES of the participants but also to the demands it places on attention and working memory. Short term memory and working memory skills are critical to a child's ability to follow verbal directions (Glover, Timme, Deyloff, Rogers & Dinell, 1987). Swanson (1996) found that older children outperformed younger children on all working memory tasks regardless of the processing condition. Rehearsal strategies are necessary when following directions to maintain awareness of information so that it can be effectively moved from short term memory into working memory (Cowan, 1996). Henry and Millar (1993) found that verbal rehearsal was not a widespread strategy in children under the age of 10 despite its ability to assist in information processing. According to Gathercole, Pickering Ambridge and Ambridge (2004), working memory abilities improve in a linear fashion between the ages of 4 and 14 and it is not until age 6 that the executive component of working memory is sufficiently developed to be used during complex tasks that require coordination of working memory subcomponents. We can hypothesise from this that skills such as executive attention and retrieval strategies may not be fully developed in the population examined in this study. The SES of the participants may also have influenced scores in this subtest as this has been found to predict differences in working memory abilities (Noble, McCandliss & Farah, 2007; Sarsour et al, 2011).

Individual differences in attention need to be considered in the interpretation of results on particular subtests. Inattention is a normal variation in typical preschool children. However Galera et al. (2011) found that risk factors such as low parental level of education and family and social problems are among the strongest early predictors of disordered attention. Furthermore, Willoughby, Pek and Greenberg (2012) observed that low caregiver education was the single best predictor of the severity of symptoms of inattention in preschoolers. Such factors are particularly relevant for the socially disadvantaged population described in this study. The reliance on auditory rather than visual attention may also have been contributing factor in the pattern of scores observed. For both expressive and receptive indexes participants scored lowest in subtests requiring the integration of short term/working

memory skills and auditory attention, namely Recalling Sentences and Concepts and Following Directions. The Concepts and Following Directions and Recalling Sentences subtests are modality specific as they rely primarily on auditory attention and do not allow for participants to demonstrate possible relative strengths in visual attention. Denckla (1996), states that these different attention skills may function independently of one another. However, there has been little research directly examining working memory, rehearsal strategies, attention and how these contribute to the ability to follow directions in preschool aged children. Such research is necessary for both typically developing children and children living in areas of social deprivation to identify specific needs in this area of receptive language.

When discussing individual subtests it should also be noted that high scores in Expressive Vocabulary suggest that the asymmetry in receptive and expressive lexical skills in infancy that was highlighted in the literature is likely to no longer be present in the preschool years. The asymmetries in production and comprehension of syntactic structures reported in the literature in early childhood may be supported by the findings of the current study with participants achieving higher scores in the Word Structure subtest (examining production of syntactic structures) than in the Sentence Structure subtest (assessing ability to understand sentences containing complex structures) based on mean scores for the whole group. However neither syntax nor vocabulary have been directly compared between receptive and expressive domains for this population. Such research may provide further clarity on specific strengths and areas of need.

The results of CELF P2 UK in the current study support previous studies showing the children from disadvantaged backgrounds are more likely to present with language delay than children from more privileged communities (Locke et al., 2002; Law et al., 2011; Letts et al., 2013). However, the current study found a somewhat lower percentage (30.5%) of children presenting with language delay compared to studies that have investigated language skills of children from similar disadvantaged communities in the UK (Locke et al., 2002; Law et al., 2011). Law et al. (2011) studied slightly older children in Scotland and found 40% had some degree of language delay and a study based in England by Locke et al. (2002) reported a higher figure of 56% of children had some degree of language delay. The relatively low percentage of children in the current study presenting with language delay is, however, similar to the percentage reported in a recent study of the association between the number of years of maternal education and language development (Letts et al., 2013). Letts et al. (2013)

found a similar percentage of children presenting with language delay as the 30% found in the current study. These authors reported that 27% had receptive delays and 25% had expressive delays in children whose mothers had minimum years of education. The different methodologies used in various studies may explain the varying estimates in the percentage of children presenting with language delay. Letts et al. (2013) cautioned that "variations in performance may differ according to the indicator of disadvantage used" (p. 142).

Lack of certain exclusionary criteria may have been a factor in the results of this study. As in the study by Law et al. (2011), participants were not excluded based on any known cognitive or language impairment as the aim was to evaluate a population based sample from a defined geographical area with particular socioeconomic characteristics. However known cognitive or language impairments have been used as an exclusionary criterion by other authors examining the language abilities of children from areas of social deprivation (e.g., Locke et al., 2002; Letts et al., 2013) and may have increased the prevalence of language delay found in this study. Another relevant point is the fact that participants were not screened for hearing loss. Hearing loss of any severity significantly impacts language development and academic achievement (Yoshinaga-Itano, Sedey, Coulter & Meh, 1998). Otitis media and hearing loss are more prevalent in children from a disadvantaged background (Egbuonu & Starfield, 1982) and so this may have influenced the profile of scores.

Standardisation and item bias in the CELF P2 UK also need to be considered. This assessment is standardised on data from a representative sample of children living in the United Kingdom, which includes Northern but not southern Ireland. We are not aware of any evidence to suggest that children from southern Ireland present with different language skills from those in Northern Ireland, for example. Nevertheless, the lack of standardisation on a southern Irish population raises a question about whether normative data from this population of children is necessary in the future. Furthermore, a randomised process of participant inclusion would have reduced the possibility of bias by giving all participants an equal chance of being selected. It is also plausible that the subtest items include pictures or words that socially disadvantaged children are less likely to be exposed to, and are therefore socially/culturally biased against such children. The question of whether or not socially disadvantaged children have fundamental deficits in language learning abilities or whether poor performance in formal assessments reflects a lack of experience and exposure to a test's particular format and stimuli (Campbell, Dollaghan, Needleman & Janosky, 1997; Locke et

al., 2002) needs to be considered when interpreting the results of studies with a specific focus on this client group.

Conclusion

This study has provided evidence of significantly lower receptive than expressive language abilities in preschool children living in an area of social deprivation. This profile is the opposite of what we have come to expect from children who are not from disadvantaged backgrounds. Analysis of subtests showed that scores for Expressive Vocabulary were significantly higher than scores for the other expressive subtests. Previous research suggests that such vocabulary tests may not be reliable indicators of language ability and so may have had the effect of inflating the children's expressive language index scores. Scores in Concepts and Following Directions were found to be significantly lower than scores for the other receptive subtests and thus may have had the effect of decreased children's receptive language index scores. Possible reasons for these results include the young age of the participants, the demands of particular subtests on memory and attention and the fact that they were from disadvantaged communities. This study has highlighted the need for caution in assuming that children's receptive language skills are equivalent or superior to expressive language skills, particularly if the children are from an area of social disadvantage. The results have indicated a need for investigations into the effect of socioeconomic variables on expressive and receptive language skills in children from disadvantaged backgrounds.

Declaration of Interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders.* (4th ed.). Washington DC: Author.

Arriaga, R.I., Fenson, L., Cronan, T. & Pethick, S.J. (1998). Scores on the MacArthur Communicative Development Inventory of children from low- and middle income families. *Applied Psycholinguistics, 19*(2), 209-223.

Bee, H.L., Barnard, K.E., Eyres, S.J., Gray, C.A., Hammond, M.A. Spietz, A.L., et al. (1982). Prediction of IQ and language skill from perinatal status, child performance, family characteristics, and mother-infant interaction. *Child Development, 53,* 1134-1156.

Benedict, H. (1979). Early lexical development: Comprehension and production. *Journal of Child Language, 6,* 183-200.

Black, E., Peppe, S. & Gibbon, F. (2008). The relationship between socio-economic status and lexical development. *Clinical Linguistics & Phonetics, 22*(4-5), 259-265.

Bracken, B. A. (1984). *Bracken Basic Concept Scale.* San Antonio: Psychological Corporation.

Campbell, T., Dollaghan, C., Needleman, H. & Janosky, J. (1997). Reducing bias in language assessment: processing-dependent measures. *Journal of Speech, Language and Heairng Research, 40*(3), 519-525.

Central Statistics Office (CSO) (2012). This is Ireland: Highlights from Census 2011, part 2. Retrieved March, 9, 2014 from http://www.cso.ie/en/media/csoie/census/documents/thisisirelandpart2census2011/This,is,Ireland,Highlights,,P2,Full,doc.pdf

Central Statistics Office (CSO) (2014). Live register. Retrieved April 3, 2014, from http://www.cso.ie/en/releasesandpublications/er/lr/liveregistermarch2014/#.Uz1JF_ldXD8

Chapman, R.S. & Miller, J.F. (1975). Word order in early two and three word utterances: Does production precede comprehension? *Journal of Speech and Hearing Research, 18,* 355-371.

Charman, T., Drew, A., Baird, C. & Baird, G. (2003b). Measuring early language development in pre-school children with autism spectrum disorder using the MacArthur Communicative Development Inventory (Infant Form). *Journal of Child Language, 30,* 213-236.

Clark, E.V. (1995). *The lexicon in acquisition.* Cambridge: Cambridge University Press.

Conti-Ramsden, G. & Durkin, K. (2012). Language development and assessment in the preschool period. *Neuropsychology Review, 22,* 384-401.

Cowan, N. (1996). Short-term memory, working memory and their importance in language processing. *Topics in Language Disorders, 17*(1), 1-17.

Denckla, M. B. (1996). A theory and model of executive function: a neuropsychological perspective. In G. R. Lyon & N. A. Krasnegor (Eds.), *Attention, memory, and executive function* (pp. 263-278). Baltimore, MD: Paul H. Brookes.

Department of Education and Skills (2014). *Early Childhood/Pre-school*. Retrieved August, 14, 2014, from http://www.education.ie/en/The-Education-System/Early-Childhood/

Dockrell, J.E. (2001). Assessing language skills in preschool children. *Child Psychology & Psychiatry Review, 6*(2), 74-82.

Dollaghan, C.A. (1987). Fast mapping in normal and language-impaired children. *Journal of Speech and Hearing Disorders, 52*, 218-222.

Edwards, S., Letts, C. & Sinka, I. (2011). *The new Reynell developmental language scales.* London: GL-Assessment.

Egbuono, L. & Starfield, B. (1982). Child health and social status. *Pediatrics, 69*(5), 550-557.

Fenson, L., Dale, P. S., Reznick, J. S., Bates, E., Thal, D. & Pethnick, S. (1994). Variability in early communicative development. *Monographs of the Society for Research in Child Development, 59*, 1–185.

Galera, C., Cote, S.M., Bouvard, M.P., Pingault, J.B., Melchior, M., Michel, G., Boivin, M. & Tremblay, R.E. (2011). Early risk factors for hyperactivity-impulsivity and inattention trajectories from age 17 months to 8 years. *Archives of General Psychiatry, 68*(12), 1267-1275.

Gathercole, S.E., Pickering, S.J., Ambridge, B. & Wearing, H. (2004). The structure of working memory from 4 to 15 years of age. *Developmental Psychology, 40*(2), 177-190.

Gershkoff-Stowe, L. & Hahn, E.R. (2013). Word comprehension and production asymmetries in children and adults. *Journal of Experimental Child Psychology, 114,* 489-509.

Goldin-Meadow, S., Seligman, M.E.P & Gelman, R. (1976). Language in the two year old. *Cognition, 4*, 189-202.

Glover, J., Timme, V., Deyloff, D., Rogers, M. & Dinell, D. (1987). Oral directions: Remembering what to do when. *Journal of Educational Research, 81,* 33-40.

Gray, S., Plante, E., Vance, R. & Henrichsen, M. (1999). The diagnostic accuracy of four vocabulary tests administered to preschool-age children. *Language, Speech, and Hearing Services in Schools, 30,* 196-206.

Haase, T. & Pratschke, J. (2012*). The 2011 Pobal HP Deprivation Index for Small Areas (SA)* Retrieved from http://www.pobal.ie/Publications/Documents/Introduction%20and%20Reference%20Tables.pdf

Henry, L. & Millar, S. (1993). Why does memory span increase with age? A review of the evidence for two current hypotheses. *European Journal of Cognitive Psychology, 5,* 241-287.

Hudry, K., Leadbitter, K., Temple, K. Slonims, V., McConachie, H., Aldred, C., et al. (2010). Preschoolers with autism show greater impairment in receptive compared with expressive language abilities. *International Journal of Language and Communication Disorders, 45*(6), 681-690.

Hurewitz, F., Brown-Schmidt, S., Thorpe, K., Gleitman, L.R., & Trueswell, J.C. (2000). One Frog, Two Frog, Red Frog, Blue Frog: Factors Affecting Children's Syntactic Choices in Production and Comprehension. *Journal of Psycholinguistic Research, 29*(6), 597-626.

Law, J., Boyle J., Harris, F., Harkness, A. & Nye, C. (1998). Screening for primary speech and language delay: a systematic review of the literature. International Journal of Language and *Communication Disorders, 33*(suppl.), 21–23.

Law, J., McBean, K. & Rush, R. (2011). Communication skills in a population of primary school-aged children raised in an area of pronounced social disadvantage. *International Journal of Language and Communication Disorders, 46*(6), 657-664.

Leonard, L., Schwartz. R., Allen, G., Swanson, L. & Loeb, D. (1989). Unusual phonological behaviour and the avoidance of homonymy in children. *Journal of Speech and Hearing Research, 32,* 583-590.

Leonard, L., Schwartz, R., Chapman, K., Rowan, L., Prelock, P., Terrell, B., et al. (1982). Early lexical acquisition in children with specific language impairment. *Journal of Speech and Hearing Research, 25*, 554-564.

Leonard, L., Schwartz, R., Swanson, L. & Loeb, D. (1987). Some conditions that promote unusual phonological behaviour in children. *Clinical Linguistics and phonetics, 1*, 23-24.

Letts, C., Edwards, S., Sinka, I., Schaefer, B. & Gibbons, W. (2013). Socio-economic status and language acquisition: children's performance on the new Reynell Developmental Language Scales. *International Journal of Language and Communication Disorders, 48*(2), 131-143.

Locke, A., Ginsborg, J. & Peers, I. (2002). Development and disadvantage: implications for the early years and beyond. *International Journal of language & Communication Disorders, 37*(1), 3-15.

Luyster, R.J., Kadlec, M.B., Carter, A. & Tager-Flusberg, H. (2008). Language assessment and development in toddlers with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 38*(8), 1426-1438.

Matthews, D., Lieven, E., Theakston, A., Tomasello, M., 2009. Pronoun co-referencing errors: challenges for generativist and usage-based accounts. *Cognitive Linguistics 20*, 599–626.

McClellan, J., Yewchuk, C. & Holdgrafer, G. (1986). Comprehension and production of word order by 2-year-old children. *Journal of Psycholinguistic Research, 15*, 97–116.

Murray, A.D. & Hornbaker, A.V. (1997). Maternal directive and facilitative interaction styles: Associations with language and cognitive development of low risk and high risk toddlers. *Development and Psychopathology, 9*, 507-516.

Noble, K.G., McCandliss, B.D. & Farah, M.J. (2007). Socioeconomic gradients predict individual differences in neurocognitive abilities. *Developmental Science, 10*(4), 464-480.

Noterdaeme, M., Amorosa, H., Mildenberger, K., Sitter, S. & Minow, F. (2001). Evaluation of attention problems in children with autism and children with a specific language disorder. *European Child and Adolescent Psychiatry, 10*(1), 58-66.

O'Donovan, J. (2009). *Review of Cork City Development Board Strategy 2009 to 2012.* Retrieved from http://www/corkcitydb.ie/publications/Cork%20City%20CDB%20Strategy%20Review%20-%20Context%20Paper.pdf

Peers, I.P., Lloyd, P. & Foster, C. (2000). *Clinical evaluation of language fundamentals-preschool, UK.* London: Psychological Corporation.

Raviv, T., Kessenich, M. & Morrison, F.J. (2004). A mediational model of the association between socioeconomic status and three-year-old language abilities: the role of parenting factors. *Early Childhood Quarterly, 19,* 528-547

Rescorla, L., Hadicke-Wiley, M. & Escarce, E. (1993). Epidemiological investigation of expressive language delay at age two. *First Language, 13,* 5-22.

Reynell, J. (1991). *Reynell developmental language scales.* Los Angeles: Western Psychological Service.

Rowe, M.L. (2008). Relation of socioeconomic status, knowledge of child development and vocabulary skill. *Journal of Child Language, 35,* 185-205.

Sarsour, K., Sheridan, M., Jutte, D., Nuru-Jeter, A., Hinshaw, S. & Boyce, W.T. (2011). Family socioeconomic status and child executive functions: The roles of language, home environment and single parenthood. *Journal of the International Neuropsychological Society, 17,* 120-132.

Schwartz, R. (1988). Early action word acquisition in normal and language-impaired children. *Applied Psycholinguistics, 9,* 111-122.

Schwartz, R., Leonard, L., Messick, C. & Chapman, K. (1987). The acquisition of object names in children with specific language impairment: Action context and word extension. *Applied Psycholinguistics, 1,* 295-306.

Semel, E., Wiig, E. H. & Secord, W.A. (2006). *Clinical evaluation of language fundamentals* (4th ed.). London: The Psychological Corporation.

Silva, P.A., McGee, R. & Williams, S.M.(1983). Developmental language delay from three to seven years and its significance for low intelligence and reading difficulties at age seven. *Developmental Medicine and Child Neurology, 25,* 783–793.

Stevenson, J. & Richman, N. (1976). The prevalence of language delay in a population of three-year-old children and its association with general retardation. *Developmental Medicine and Child Neurology, 18,* 431–441.

Swanson, H.L. (1996). Individual and age-related differences in children's working memory. *Memory & Cognition, 24*(1), 70-82.

Tager-Flusberg, H., Paul, R. & Lord, C. (2005). Language and communication in autism. In F.R. Volkmar, R. Paul, A. Klin & D. Cohen (Eds.), Handbook of autism and pervasive developmental disorders (3rd., Vol.1, pp.335-364). New Jersey: John Wiley & Sons.

Teoh, W.Q., Brebner, C. & McCormack, P. (2012). Assessing the language skills of children from culturally and linguistically diverse backgrounds: The expressive vocabulary performance of Singaporean English-Mandarin bilingual pre-schoolers. *International Journal of Speech-Language Pathology, 14*(3), 281-291.

The Department of Education and Science (2005). *DEIS (Delivering Equality of Opportunity in Schools): An action plan for educational inclusion.* Retrieved March 2, 2014, from http://www.education.ie/en/Publications/PolicyReports/deis_action_plan_on_educational_inclusion.pdf

Ungerer, J.A. & Sigman, M. (1981). Symbolic play and language comprehension in autistic children. *Journal of the American Academy of Child Psychiatry, 20*(2), 318-337.

Walker, D., Greenwood, C., Hart, B. & Carta, J. (1994). Prediction of school outcomes based on early language production and socioeconomic factors. *Child Development, 65*(2), 606-621.

Wiig, E.H., Secord, W. & Semel, E. (1992). *Clinical evaluation of language fundamentals – preschool*. London: The Psychological Corporation.

Wiig, E.H., Secord, W.A. & Semel, E. (2004). *Clinical evaluation of language fundamentals: preschool* (2nd ed.). San Antonio: Psychological Corporation.

Willoughby, M.T., Pek, J. & Greenberg, M.T. (2012). Parent-reported attention deficit/hyperactivity symptomatology in preschool-aged children: factor structure,

developmental Change, and early risk factors. *Journal of Abnormal Child Psychology, 40*(8), 1301-12.

Wong, V., Lee, P.W., Lieh-Mak, F., Yeung, C.Y., Luk, S.L. & Yiu, E. (1992). Language screening in preschool Chinese children. *European Journal of Disorders of Communication, 27*(3), 247-264.

Yoshinaga-Itano, C., Sedey, A.L., Coulter, D.K. & Mehl, A.L. (1998). Language of early- and later-identified children with hearing loss. *Pediatrics, 102*(5), 1161-1171