The Efficacy of a Whole School Vocabulary Intervention Programme in Secondary Schools in Areas of Social Disadvantage

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Abstract

**Purpose:** Vocabulary difficulties are common in adolescents, particularly in adolescents in areas of social disadvantage (Spencer et al. 2012). However, research on interventions for improving vocabulary skills in secondary school students is limited (Cirrin & Gillam 2008). This study evaluated the efficacy of a collaborative, whole school vocabulary intervention programme for improving vocabulary skills on selected measures of vocabulary, in secondary school students, not identified with language impairment, from schools in socially disadvantaged areas.

**Method:** Four Irish secondary schools in areas of social disadvantage were chosen to participate in the current study. Two schools were randomly assigned to a treatment group, and two schools to a control group. First year students’ vocabulary skills were evaluated on selected measures of vocabulary at pre-treatment ($n=245$) and post-treatment ($n=231$), using three subtests from the CELF-4, and the BPVS-3.

**Results:** The treatment group improved significantly more than the control group on raw score versions of three out of five measures, suggesting that treatment had a significant effect in improving the treatment group’s participants’ raw scores on those three measures. There were no significant differences in raw scores between the treatment and control groups on the other two measures, or on any standard score versions of the measures. The treatment group alone improved on both raw score and standard score versions of all measures from pre-treatment to post-treatment. The control group alone improved on both raw score and standard score versions of three out of five measures.

**Conclusion:** Results of the current study suggest that a collaborative whole school vocabulary intervention approach using instructional strategies for vocabulary learning is a promising approach for improving vocabulary skills (on certain vocabulary measures) in secondary school students, not identified with language impairment, from schools in socially disadvantaged areas. Further studies using more sensitive measures for testing participants’ abilities to employ strategies for vocabulary learning are warranted.

**Key Words:** adolescence, social disadvantage, vocabulary intervention, collaborative whole school intervention
1. Introduction

This literature review aims to highlight research relating to language and vocabulary development in adolescence, and how language difficulties can often arise at this stage of development. It also aims to highlight research relating to language difficulties and social disadvantage, and the implications of such difficulties on children’s academic success and emotional well-being. Studies done on language intervention in secondary schools are also reviewed.

1.1 Language Development in Adolescence

Typically developing adolescents entering into a more advanced stage of language development have mastered skills learned during early childhood (Nippold 1993). This later stage of development requires adolescents to employ more advanced cognitive skills, and develop language for more intensive social situations, more difficult literacy tasks, and higher levels of critical thinking (Paul & Norbury 2012; Harststhorne 2011; Nippold 2004).

Many adolescents struggle with certain aspects of more advanced language, such as difficult vocabulary, and increased demands on cognitive function, metacognitive skills, and metalinguistic skills (Paul & Norbury 2012; Nippold 2004). Weak oral language and literacy skills can lead to difficulties when dealing with more intense curricular demands, thus impacting on adolescents’ ability to access the educational curriculum (Hartsthorne 2011; Paul & Norbury 2012; Nippold 2004). These difficulties with language and accessing the secondary school curriculum often lead to poor academic achievement (Durkin et al 2009; Conti-Ramsden 2008; Paul & Norbury 2012; Joffe & Nippold 2012; Hartsthorne 2011), and an increase in social, emotional, and behavioural difficulties (SEBD) (Joffe & Black 2012; Wadman et al 2008; Durkin & Conti-Ramsden 2010; Clegg et al 2005; Hartsthorne 2011; Lindsay & Dockrell 2008; Lindsay & Dockrell 2012).

Furthermore, research suggests that these more intense curricular demands often reveal students with language impairment (LI) that may not have been previously identified (Larson & McKinley 2003; Nippold 2004). However, students with LI may still go undetected, as their oral language skills may appear to be adequate for everyday, functional conversation (Nippold 2007).
1.2 Vocabulary Development in Adolescence

During the more advanced language learning stage, adolescents begin to acquire new vocabulary that may be abstract and low in frequency (Nagy et al 1993). They also begin to acquire more advanced vocabulary from literate language forms (Paul & Norbury 2012; Tolchinsky 2004), and more advanced skills for defining words (Paul & Norbury 2012; Nippold et al 1999). In secondary school, vocabulary knowledge is a strong predictor of academic achievement (Cunningham & Stanovich 1997), and has a strong role in literacy and cognitive development (Cunningham & Stanovich 1997; Nagy et al 1985; Sweet & Snow 2004).

Many adolescents face problems when learning new words in secondary school (Larson & McKinley 2003). Vocabulary knowledge is sensitive to social and cultural experiences, and both word learning skills and the size of vocabulary depend on the exposure to new words that adolescents receive (Dockrell & Messer 2004). In secondary school, explicit vocabulary instruction is seldom provided to students (Carlisle et al 2000; Lesaux et al 2010), which often provides for insufficient exposure to new vocabulary terms needed for effective vocabulary acquisition (Dockrell & Messer 2004). Poor vocabulary skills are common in adolescents with LI (Dockrell et al 2007; Nash & Donaldson 2005). However, not all adolescents with LI have vocabulary problems (Nash & Donaldson 2005; Dockrell & Messer 2004), and adolescents not identified with LI may have unidentified vocabulary difficulties (Paul & Norbury 2012).

1.3 Prevalence and Persistence of Language Impairment

According to Joffe and Black (2012), the prevalence of LI in secondary school is not well researched. However, a recent UK government report found that 8.4% of secondary school students have been identified as having communication difficulties that require specialist support (Department of Education 2011a cited in Joffe & Black 2012). Nippold (2004) estimates that 10% of adolescents have communication difficulties, and Sanger et al (2003) report a high prevalence of unidentified language difficulties at the secondary school level.

Studies have shown that children with communication difficulties may continue to have difficulties into adolescence and sometimes adulthood (Conti-Ramsden et al 2009; Rescorla...
2009; Tuller et al 2012; Clegg et al 2005; Vance & Clegg 2010; Lindsay et al 2007; Durkin & Conti-Ramsden 2007; Tallal & Benasich 2002). In one study by Conti-Ramsden and Durkin (2008), 118 16-year-old students were tested for language difficulties longitudinally from the age of 7. Results showed that 85% of the students’ language difficulties persisted into adolescence (Conti-Ramsden & Durkin 2008).

Clegg et al (2005), studied seventeen males with developmental language disorder (DLD) in middle childhood, early adult life, and in their mid-thirties. They were assessed on a variety of assessments. Results indicated that when compared with their siblings and other age-matched peers, those with DLD showed persistent, significant difficulties with language (Clegg et al 2005).

1.4 Language and Social Disadvantage

A correlation between socioeconomic disadvantage and delayed early language development is recognized (Ginsborg 2006; Locke et al 2002; Dockrell & Messer 2004; Sohr-Preston et al 2013), with reports of 50% of young children in areas of social disadvantage having language delay (Ginsborg 2006). Research has consistently shown that language difficulties and social disadvantage often have an effect on academic achievement, IQ levels, and emotional and behavioural functioning (Law 2006; McLoyd 1998; Bryan et al 2007; Joffe & Black 2012). In particular, vocabulary difficulties have been shown to be prevalent in young children from areas of social disadvantage (Sohr-Preston et al 2013; Whitehurst & Fischel 2000; Beck & McKeown 2007). In adolescence, the correlation between social disadvantage and language difficulties has not been as well researched, but is still recognized in the literature (Hartsthorne 2011; Ginsborg 2006; Locke 2006).

In a study by Spencer et al (2012), one cohort of 13-14 year-old students from a secondary school in a lower socioeconomic area, and another cohort of the same age from a secondary school in a relatively high socioeconomic area, were both assessed on standardized language assessments measuring receptive and expressive language skills. The results of the assessments showed that the cohort from the lower socioeconomic area performed significantly lower than the normative mean on all measures of language ability, and significantly lower than the higher socioeconomic cohort. The lowest scores for the lower socioeconomic cohort were on measures of vocabulary. Results of this study indicate that
social disadvantage is associated with language difficulties in adolescence, and vocabulary skills are of particular difficulty for this group (Spencer et al 2012).

1.5 Lack of Support for Secondary School Students with Language Difficulties

There has been little research done on intervention methods for secondary school students with language difficulties, and no published guidelines have been developed (Cirrin & Gillam 2008). In 2008, Cirrin and Gillam systematically reviewed language intervention studies for school-age children. Only 21 studies were found to meet the authors’ search criteria, and only three of those studies included participants over the age of 10 years (Cirrin & Gillam 2008). Furthermore, only one of those three studies, which employed direct instruction of analogical reasoning, found significant positive effects of intervention (Masterson & Perry 1999). It is evident that not only is the amount of research on language intervention for adolescents limited, but significant findings for effective treatments for improving adolescents’ language skills are also scarce (Cirrin & Gillam 2008).

There is also little specialist support being provided to adolescents with LI in secondary school (Bercow 2008; Clegg et al 2012; Larson & McKinley 2003; Law et al 2012; Wilson et al 2010; Hartsthorne 2011), and in particular, to adolescents from areas of social disadvantage (Law 2006; Locke 2006). Bercow (2008) and Wilson et al (2010) both highlight the fact that service provision for adolescents with communication difficulties in secondary schools in the United Kingdom (UK) is virtually non-existent, and Larson & McKinley (2003) report similar findings for secondary schools in the United States.

1.6 Methods for Vocabulary Instruction

Vocabulary instruction has been the subject of many studies. Baumann et al (2003) summarize the types of vocabulary instruction that have been studied after 1970. The authors include studies supporting strategies such as definition or synonym instruction, using mnemonic keywords, semantic mapping, and context clues (Baumann et al 2003). However, it is important to note that not all of these studies were done on adolescents (Baumann et al 2003).

The Beck and McKeown rich vocabulary instruction method of teaching vocabulary involves methods such as teaching adolescents with LI to use context, and to use new words in an
oral language activity with peers. The authors recommend these methods of instruction for improving vocabulary knowledge, but do not state their efficacy (Beck et al 2002).

Fukkink and de Glopper’s (1998) meta-analysis of vocabulary instruction included 18 out of 19 studies done on adolescents without LI. These studies showed that adolescents without LI benefit from instruction on how to derive word meaning from context (Fukkink & de Glopper 1998). Stahl and Fairbanks’ (1986) meta-analysis on vocabulary instruction included 14 studies on adolescents without LI. These studies also showed that the most effective instructional methods for teaching vocabulary involved both definitional and contextual information (Stahl & Fairbanks 1986). Jitendra et al (2004) summarize types of vocabulary instruction for students with learning difficulties. These instructional methods include explicit vocabulary instruction, and teaching students how to use context and definition to infer the meaning of a word. These instructional methods have all been shown to improve vocabulary knowledge in students with learning difficulties (Jitendra et al 2004). Only a few of the studies included in the summary, however, were done on adolescents (Jitendra et al 2004).

Joffe (2006) describes an unpublished study on 54 secondary school students identified with LI, who were given either narrative or vocabulary intervention. The adolescents were assessed both pre and post intervention, and were given the intervention in small groups at school. The vocabulary intervention programme included teaching strategies for word finding, mind mapping, word categorisations, and use of synonyms, antonyms, and definitions. Improvements were observed on some assessments, however, the results showed no significant improvements on standardized measures. Although improvements were not significant, the intervention resulted in small improvements over a relatively short period of time. On a researcher-developed questionnaire, participants reported feelings of improvement in many language modalities. There was no control group used in this study, and the authors indicated the need for further research (Joffe 2006).

1.7 Whole School Intervention

Although there is research to support a collaborative, classroom based type of intervention for improving language abilities in young children (Throneburg et al 2000; Nippold 2011; Paul
& Norbury 2012; McIntosh et al 2007), there is limited evidence for this type of intervention for adolescents, especially for targeting vocabulary specifically (Lesaux et al 2010).

In a randomised control trial (RCT) study by Starling et al (2012), a collaborative whole school intervention approach was implemented in order to examine whether training secondary school teachers to modify their oral and written language, would improve the language abilities in their secondary school students with LI. Students were tested pre and post intervention on measures of listening and reading comprehension, and oral and written expression. Results showed a significant increase in use of modified teaching techniques in the treatment group of teachers compared to the control group. Students that received the modified instruction showed significant improvements on measures of listening comprehension and written expression when compared to the control group. Only students with identified LI or suspected LI were included in the study, and they were chosen by the teachers (Starling et al 2012).

In a quasi-experimental, mixed method design study by Lesaux et al (2010), participants were both language minority (LM) and English speaking adolescent students. The aim of the study was to determine whether a collaborative whole school vocabulary intervention programme improved vocabulary and reading comprehension in students from low-performing, urban middle schools, with high numbers of LM students. Students were tested pre and post intervention on measures of reading comprehension, reading vocabulary comprehension, and morphological awareness. The intervention implemented was a text-based vocabulary intervention, which focused on reading vocabulary and improving reading comprehension. Results showed that the students in the treatment group made significant improvements on researcher-developed measures of vocabulary, and marginally significant improvements on a standardized measure of reading comprehension (Lesaux et al 2010).

1.8 Current Research Study

Research has shown that adolescents often have difficulties with aspects of more advanced language development, and in particular with more advanced vocabulary development (Paul & Norbury 2012). These difficulties can lead to poor academic success (Durkin et al 2009), and social, emotional, and behavioral difficulties (Joffe & Black 2012). These difficulties can also often persist into adulthood (Conti-Ramsden & Durkin 2008). Research has also
established that a correlation between vocabulary difficulties and social disadvantage exists, in both younger children and adolescents (Ginsborg 2006; Spencer et al 2012). However, there is a lack of support for secondary school students with language difficulties (Clegg et al 2012), and research on interventions for improving language skills in secondary school students (particularly from areas of social disadvantage) is limited (Cirrin & Gillam 2008). With these points in mind, the researchers of the current study aimed to investigate the efficacy of a collaborative whole school vocabulary intervention programme for improving vocabulary skills in secondary school students, not identified with LI, from schools in socially disadvantaged areas.
2. Methodology

The current study aimed to investigate whether a collaborative whole school vocabulary intervention programme improved vocabulary skills in secondary school students, not identified with LI, from schools in socially disadvantaged areas.

The researchers of the current study hypothesized the following:

1. The students who received treatment would improve significantly more on selected measures of vocabulary than students who did not receive treatment.
2. There would be a relationship between a lower amount of improvement on selected vocabulary measures and higher levels of social, emotional, and behavioural difficulties (SEBD) (Joffe & Black 2012).

2.1 Study Design

A randomized control trial (RCT) design was chosen for the current study. Convenience sampling (Polgar & Thomas 2000) was employed in choosing four Irish schools in areas of social disadvantage from a particular geographical area to take part in the current study. The four schools were sourced by the main researcher, a qualified Speech and Language Therapist (SLT). The main researcher randomly assigned two of the schools to the treatment group, which received the treatment programme for one school semester. The other two schools were randomly assigned to the control group. The control group was placed in a wait condition, and received the treatment programme after a wait period of one school semester.

2.2 Participants

All first year students in the chosen four schools were invited to participate in the study. Participant inclusionary, exclusionary, and withdrawal criteria is outlined below:

2.2.1 Inclusionary Criteria:
- Parental consent
- Student consent
- Present in school on days of Time 1 assessment
2.2.2 Exclusionary Criteria:
- No parental consent
- No student consent
- Absent from school on days of Time 1 assessment

2.2.3 Withdrawal Criteria:
- Participant felt uncomfortable at any time during the study
- Absent from school on days of Time 2 assessment

In total, there were 245 first year student participants at Time 1 who met the inclusionary criteria. 31 of the participants were reported to have English as an additional language. The median age at the beginning of intervention was 151.0 months (12 years 7 months) ($M=152.49$, $SD =6.577$). The student sample was 69.4% female ($n=170$), and 30.6% male ($n=75$). 14 participants were withdrawn from the study, leaving at total of 231 participants at Time 2. 10 of these students were absent on the days of Time 2 assessment, and 4 students had left the schools at Time 2.

2.3 Materials

2.3.1 Participant Selection Materials:
Students were given an ‘Information for Students’ leaflet and a student consent form (Appendix 1) on the day of assessment at Time 1. Parents of first year students were given an ‘Information for Parents’ leaflet and a parental consent form before the study began (Appendix 2).

2.3.2 Assessment Materials:
Standardized measures of receptive and expressive vocabulary skills were taken using three subtests from the Clinical Evaluation of Language Fundamentals – 4 (CELF-4) (Semel et al 2003). The CELF-4 was chosen for the current study, as it has been shown to be useful in providing information about students’ language skills (Crowley 2010), and it reports good validity and reliability (Semel et al 2003). The Word Classes subtest, which divides into Word Classes Receptive and Word Classes Expressive, was used. This subtest requires participants to identify and explain the relationship between two words. The Word Definitions subtest, which requires participants to give definitions of heard words in a sentence context, was
used. Standard scores (SS) from raw scores (RS) are calculated for the Word Classes and Word Definitions subtests. Lastly, the Word Associations subtest was also used. This subtest involves naming components of a given category. The raw score can be calculated into a criterion referenced score. CELF-4 scores are compared to UK referenced norms.

Additional standardized measures of receptive vocabulary skills of single words were taken using the British Picture Vocabulary Scale – 3rd edition (BPVS-3) (Dunn & Dunn 2009). The BPVS-3 was chosen for the current study as it is reported to have good validity and reliability (Dunn & Dunn 2009). The assessment requires the participant to point to pictures corresponding to heard words, and a SS is calculated and compared to UK referenced norms.

The teacher version of the Strengths and Difficulties Questionnaire (Youthinmind 2012) was used to explore the participants’ social, emotional, and behavioural functioning (Goodman 1997). The questionnaire requires the participants’ teachers to complete a 3-point rating scale for 25 statements. A total difficulties (‘Overall Stress’) score is calculated, and is compared to UK referenced norms. Higher Overall Stress scores indicate greater SEBD (Goodman 1997). The SDQ was chosen because the teachers implementing the programme in the current study were accustomed to using it.

2.3.3 Intervention Materials:

Teachers implementing the intervention programme were provided with a written overview of the intervention sessions, and additional information and materials to use while implementing the programme.

2.4 Procedure

2.4.1 Assessment Procedure:

Measurement outcomes for the treatment group were taken at Time 1 (pre-treatment) and Time 2 (post-treatment). Measurement outcomes for the control group were also taken at Time 1 and Time 2. A total of five vocabulary measures were recorded for each participant, with four of these measures using both RS and SS versions. These five measures included: Word Classes Receptive (RS and SS), Word Classes Expressive (RS and SS), Word Definitions (RS and SS), BPVS (RS and SS), and Word Associations RS.
Assessment and scoring was carried out by the researchers, which included six SLT students, and two qualified SLTs. The researchers were aware of which students were in the treatment and control groups, but each researcher assessed different participants at Time 1 and Time 2.

2.4.2 Intervention Procedure:

The intervention programme was implemented by 7 English teachers and 4 resource teachers. The main researcher chose to shorten and adapt Victoria Joffe’s Vocabulary Enrichment Programme (VEP) (Joffe 2011) to include additional resources, and to fit a whole school intervention approach. This shortened version included 12 sessions (sessions 1 to 10 of Joffe’s VEP, and two revision sessions), implemented over a period of 12 weeks. Joffe’s VEP targets vocabulary learning through word associations, categorization, mind mapping and word-building. The main researcher trained the teachers in how to implement the programme, and also supported the teachers throughout intervention by meeting with them once weekly.

2.4.3 Attendance and Treatment Fidelity:

Attendance and treatment fidelity measures were taken throughout the 12 weeks of intervention. Teachers noted which students were absent for each session, and which students found each session difficult.

2.5 Ethical Considerations

This study received ethical approval from the University of Limerick Faculty of Education and Health Sciences Research Ethics Committee. All student participants and their parent signed a consent form following verbal and written explanation from the tester prior to assessment at Time 1. Participants in the control group received the intervention programme after a wait period of one school semester.

2.6 Data Analyses

Independent t-tests used to determine whether there was a significant difference between the treatment and control groups’ scores at Time 1, and tests of normality, were conducted on the beginning cohort of 245 participants. Parametric mixed-between-within subjects
analysis of variance (ANOVA) tests and paired t-tests were used, which caused the 14 participants that did not complete the study to be excluded from the data analyses. However, there were no differences in either age or performance on all language measures between the participants who withdrew from the study and the participants who remained. Students identified with English as an additional language were included in the data analyses as the researchers wanted the sample of data to be representative of students in schools from socially disadvantaged areas (Borman & Rachuba 2001).

To determine the impact of intervention, mixed-between-within subjects ANOVAs were conducted on all measures comparing the treatment and control groups. Post-hoc analyses were carried out using paired t-tests. To determine whether there was a relationship between higher levels of SEBD and a lower amount of improvement, Pearson correlation tests were run on all measures for the treatment group. To determine amount of improvement, Time 1 scores were subtracted from Time 2 scores. The probability at which differences and relationships were determined to be statistically significant was $p < .05$.

3. Results

As a precursor for the analyses, tests of normality were run on the data. For some of the measures, the $p$ value was less than .05 in the Kolmogorov-Smirnov test, which violates the assumption of normality (Pallant 2007). However, parametric tests were deemed suitable for analyses in the current study given the large sample sizes (Pallant 2007).

As an additional precursor for the analyses, independent t-tests were run on all measures to determine whether there was a significant difference between the treatment and control groups’ scores at Time 1. Results showed there were no significant differences in scores between the two groups at Time 1 on any of the RS or SS versions of all five measures (Appendix 3).
3.1 The Impact of Treatment on Student Improvement

ANOVA\text{s} were carried out comparing the treatment and control groups, to determine the impact of treatment on student improvement from Time 1 to Time 2 on all measures. On participants’ BPVS Raw Scores, there was a significant interaction effect between treatment and time, $F(1, 229) = 6.454, p = .012$, suggesting treatment had an effect on participants’ improvement. There was a substantial main effect for time, $F(1, 229) = 42.745, p = .0001$, with both groups together showing an improvement in BPVS Raw Scores from Time 1 to Time 2 (Tables 1 and 2). The main effect comparing the two groups was not significant, $F(1, 229) = .727, p = .395$. Figure 1 displays the interaction effect between treatment and time on BPVS Raw scores.

*Figure 1: Interaction effect between treatment and time for BPVS Raw Scores*
On participants’ Word Classes Expressive Raw Scores, there was a significant interaction effect between treatment and time, $F(1, 229) = 6.062, p = .015$, suggesting treatment had an effect on participants’ improvement. There was a substantial main effect for time, $F(1, 229) = 26.696, p = .0001$, with both groups together showing an improvement in Word Classes Expressive Raw Scores from Time 1 to Time 2 (Tables 1 and 2). The main effect comparing the two groups was not significant, $F(1, 229) = 2.175, p = .142$. Figure 2 displays the interaction effect between treatment and time on Word Classes Expressive Raw Scores.

![Figure 2: Interaction effect between treatment and time for Word Classes Expressive Raw Scores](image)
On participants’ Word Associations Raw Scores, there was a significant interaction effect between treatment and time, \( F(1, 229) = 6.811, p = .010 \), suggesting treatment had an effect on participants’ improvement. There was a substantial main effect for time, \( F(1, 229) = 14.729, p = .0001 \), with both groups together showing an improvement in Word Associations Raw Scores from Time 1 to Time 2 (Tables 1 and 2). The main effect comparing the two groups was not significant, \( F(1, 229) = .444, p = .506 \). Figure 3 shows the interaction effect between treatment and time on Word Associations Raw Scores.

\[ \text{Figure 3: Interaction effect between treatment and time for Word Associations Raw Scores} \]

On participants’ raw scores on the remaining two measures (Word Definitions and Word Classes Receptive), there were no significant interaction effects between treatment and time, suggesting that treatment did not have a significant effect on improving participants’ scores. However, there were substantial main effects for time, suggesting that both groups together significantly improved from Time 1 to time 2 on these two measures (Appendix 4).

On participants’ scores on all four SS versions of the measures (Word Classes Expressive, Word Classes Receptive, Word Definitions, BPVS), there were no significant interaction effects between treatment and time, again suggesting that treatment did not have a
significant effect on improving participants’ scores. However, there were significant main effects for time, suggesting that both groups together significantly improved from Time 1 to Time 2 on SS versions of these four measures (Appendix 5). Table 1 (treatment group), and Table 2 (control group) display the means and standard deviations of participants’ scores for RS versions of all five measures across Time 1 and Time 2. Table 3 (treatment group) and Table 4 (control group) display the means and standard deviations of participants’ scores for all four SS versions of the measures, across Time 1 and Time 2.

Paired t-tests were conducted to evaluate whether the treatment and control groups, separately, showed significant improvements in scores from Time 1 to Time 2 on all measures. Results of the paired t-tests run on the treatment group’s participants’ scores showed that the treatment group significantly improved from Time 1 to Time 2 on all five RS versions (Table 1) and all four SS versions (Table 3) of the measures.

Results from the paired t-test conducted on the control group’s participants’ scores showed a significant improvement from Time 1 to Time 2 on both RS (Table 2) and SS (Table 4) versions of three out of five measures. However, results showed a non-significant improvement on the other two measures (Word Classes Expressive (RS and SS versions) and Word Associations RS) (Tables 2 and 4).
<table>
<thead>
<tr>
<th>Subtest</th>
<th>Mean Time 1</th>
<th>Mean Time 2</th>
<th>SD Time 1</th>
<th>SD Time 2</th>
<th>Mean Difference</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Tailed</th>
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<td>3.9569</td>
<td>3.9614</td>
<td>-1.1748</td>
<td>-1.6066 to -0.7431</td>
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<td>142</td>
<td>0.0001</td>
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<td>9.210</td>
<td>3.3751</td>
<td>3.7527</td>
<td>-1.5385</td>
<td>-2.0608 to -1.0162</td>
<td>-5.823</td>
<td>142</td>
<td>0.0001</td>
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</tr>
<tr>
<td>Word Definition RS</td>
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<td>18.993</td>
<td>7.7802</td>
<td>8.5814</td>
<td>-1.9371</td>
<td>-2.7405 to -1.1336</td>
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<td>49.524</td>
<td>11.3251</td>
<td>11.7634</td>
<td>-3.6993</td>
<td>-5.1741 to -2.2245</td>
<td>-4.959</td>
<td>142</td>
<td>0.0001</td>
<td>2 tailed</td>
</tr>
</tbody>
</table>

*Table 1: Treatment group scores on RS versions of all measures from Time 1 to Time 2*
<table>
<thead>
<tr>
<th>Subtest</th>
<th>Mean Time 1</th>
<th>Mean Time 2</th>
<th>SD Time 1</th>
<th>SD Time 2</th>
<th>Mean Difference</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Classes Receptive RS</td>
<td>12.398</td>
<td>13.182</td>
<td>4.3748</td>
<td>4.4838</td>
<td>-.7841</td>
<td>-1.2686 to -.2996</td>
<td>-3.217</td>
<td>87</td>
<td><strong>0.002</strong></td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Classes Expressive RS</td>
<td>7.477</td>
<td>8.023</td>
<td>4.0028</td>
<td>4.1162</td>
<td>-.5455</td>
<td>-1.1073 to .0164</td>
<td>-1.930</td>
<td>87</td>
<td><strong>0.057</strong></td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Definitions RS</td>
<td>16.750</td>
<td>18.318</td>
<td>9.1227</td>
<td>9.7421</td>
<td>-1.5682</td>
<td>-2.5936 to -.5428</td>
<td>-3.040</td>
<td>87</td>
<td><strong>0.003</strong></td>
<td>2 tailed</td>
</tr>
<tr>
<td>BPVS RS</td>
<td>124.148</td>
<td>126.057</td>
<td>20.1646</td>
<td>20.8318</td>
<td>-1.9091</td>
<td>-3.2993 to -.5189</td>
<td>-2.730</td>
<td>87</td>
<td><strong>0.008</strong></td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Associations RS</td>
<td>48.352</td>
<td>49.057</td>
<td>12.5881</td>
<td>13.6174</td>
<td>-.7045</td>
<td>-2.3306 to .9216</td>
<td>-.861</td>
<td>87</td>
<td><strong>0.392</strong></td>
<td>2 tailed</td>
</tr>
</tbody>
</table>

*Table 2: Control group scores on RS versions of all measures from Time 1 to Time 2*
<table>
<thead>
<tr>
<th>Subtest</th>
<th>Mean Time 1</th>
<th>Mean Time 2</th>
<th>SD Time 1</th>
<th>SD Time 2</th>
<th>Mean Difference</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Classes Receptive SS</td>
<td>7.510</td>
<td>8.224</td>
<td>3.1464</td>
<td>3.3764</td>
<td>-.7133</td>
<td>-1.0754 to -.3512</td>
<td>-3.894</td>
<td>142</td>
<td>0.0001</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Classes Expressive SS</td>
<td>6.035</td>
<td>6.923</td>
<td>2.8443</td>
<td>3.0352</td>
<td>-.8881</td>
<td>-1.3229 to -.4533</td>
<td>-4.038</td>
<td>142</td>
<td>0.0001</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Definitions SS</td>
<td>6.175</td>
<td>6.755</td>
<td>2.8217</td>
<td>3.0724</td>
<td>-.5804</td>
<td>-0.8717 to -.2892</td>
<td>-3.939</td>
<td>142</td>
<td>0.0001</td>
<td>2 tailed</td>
</tr>
<tr>
<td>BPVS SS</td>
<td>83.09</td>
<td>85.853</td>
<td>12.748</td>
<td>12.9288</td>
<td>-2.7622</td>
<td>-3.8974 to -1.6271</td>
<td>-4.810</td>
<td>142</td>
<td>0.0001</td>
<td>2 tailed</td>
</tr>
</tbody>
</table>

Table 3: Treatment group scores on the four SS versions of the measures from Time 1 to Time 2
Table 4: Control group scores on the four SS versions of the measures from Time 1 to Time 2

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Mean Time 1</th>
<th>Mean Time 2</th>
<th>SD Time 1</th>
<th>SD Time 2</th>
<th>Mean Difference</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Classes Receptive SS</td>
<td>7.330</td>
<td>7.807</td>
<td>3.4632</td>
<td>3.7197</td>
<td>-.4773</td>
<td>-.8899 to -.0646</td>
<td>-2.299</td>
<td>87</td>
<td><strong>.024</strong></td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Classes Expressive SS</td>
<td>5.705</td>
<td>6.000</td>
<td>3.2806</td>
<td>3.3114</td>
<td>-.2955</td>
<td>-.7612 to -.1703</td>
<td>-1.261</td>
<td>87</td>
<td>.211</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Definitions SS</td>
<td>5.943</td>
<td>6.523</td>
<td>3.3196</td>
<td>3.5493</td>
<td>-.5795</td>
<td>-.9700 to -.1891</td>
<td>-2.950</td>
<td>87</td>
<td><strong>.004</strong></td>
<td>2 tailed</td>
</tr>
<tr>
<td>BVPS SS</td>
<td>83.39</td>
<td>84.989</td>
<td>12.937</td>
<td>14.4941</td>
<td>-1.6023</td>
<td>-2.8955 to -.3090</td>
<td>-2.463</td>
<td>87</td>
<td><strong>.016</strong></td>
<td>2 tailed</td>
</tr>
</tbody>
</table>
3.2 The Relationship between SEBD and Amount of Improvement

The relationship between Overall Stress scores (as measured by the SDQ teacher rating form) and the amount of improvement in the treatment group on both RS and SS versions of all five measures, was investigated using Pearson product-moment correlation coefficient. Preliminary analyses on both RS and SS versions of all five measures were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity.

There were significant moderate (Pallant 2007) negative correlations between Overall Stress scores and the amount of improvement on Word Classes Expressive Raw Scores \( (r = -.241, n = 130, p = .006) \), Word Definitions Raw Scores \( (r = -.238, n = 130, p = .006) \), and Word Classes Expressive Standard Scores \( (r = -.253, n = 130, p = .004) \), with higher Overall Stress scores associated with a lower amount of improvement on these measures.

There were non-significant small (Pallant 2007) negative correlations between Overall Stress scores and the amount of improvement on BPVS Raw Scores \( (r = -.105, n = 130, p = .235) \), and BPVS Standard Scores \( (r = -.112, n = 130, p = .204) \), with higher Overall Stress scores associated with a lower amount of improvement on these measures. There was a significant small negative correlation between Overall Stress scores and the amount of improvement on Word Definitions Standard Scores \( (r = -.184, n = 130, p = .036) \), with higher Overall Stress scores associated with a lower amount of improvement on this measure.

There were non-significant very weak negative correlations between Overall Stress scores and the amount of improvement on Word Classes Receptive Raw Scores \( (r = -.005, n = 130, p = .954) \), and Word Classes Receptive Standard Scores \( (r = -.065, n = 130, p = .460) \), with higher Overall Stress scores associated with a lower amount of improvement on these measures. There was a non-significant very weak positive correlation between Overall Stress scores and the amount of improvement on Word Associations Raw Scores \( (r = .007, n = 130, p = .936) \), with higher Overall Stress scores associated with a higher amount of improvement on this measure.
4. Discussion

4.1 The Impact of Treatment on Student Improvement

The primary aim of the current study was to investigate the efficacy of a collaborative whole school vocabulary intervention programme to improve vocabulary skills in secondary school students, not identified with LI, from schools in socially disadvantaged areas. The researchers hypothesized that the students who received treatment would improve significantly more on selected measures of vocabulary than those students who did not receive treatment.

Results of the analyses comparing the treatment and control groups’ scores showed that the treatment group improved significantly more than the control group on RS versions of three out of five vocabulary measures. This supports the researchers’ hypothesis, and suggests that treatment was effective for improving participants’ raw scores on these particular measures of vocabulary. These measures included one measure for receptive vocabulary (BPVS) and two measures for expressive vocabulary (Word Classes Expressive, and Word Associations) (Figures 1, 2, and 3). There were no significant differences in raw scores between the treatment and control groups on the remaining two measures (Word Classes Receptive, Word Definitions) (Appendix 4), which contradicts the researchers’ hypothesis. However, one cannot state that treatment had no effect on participants’ improvement on these two measures, only that treatment did not have a significant effect. One possible reason for why there was no significant improvement in raw scores on the Word Definitions subtest may be that the words used in this subtest were not specifically taught throughout the programme. A possible explanation for why treatment did not have a significant effect on improving Word Classes Receptive raw scores, but had a significant effect on improving Word Classes Expressive raw scores, may be that at Time 1, students may have understood the relationships between the words (Word Classes Receptive) but may not have been able to explain the relationships (Word Classes Expressive). One could speculate that treatment may have helped students improve their ability (at Time 2) to explain the relationships between words they already knew at Time 1, but may not have helped their ability to understand any new word relationships at Time 2.
Although treatment was effective for improving participants’ raw scores on three out of five measures, there were no significant differences in scores between the treatment and control groups on SS versions of the measures (Appendix 5). One possible reason for this may be that raw scores are often more sensitive to change (Flippo & Caverly 1999). Another possible explanation may be that measures used in the study may not have been sensitive enough to detect participants’ improvement in skills learned throughout the programme. Measures used in the study tested vocabulary knowledge, rather than the participants’ abilities to employ strategies for vocabulary learning (as was taught in the intervention programme). In addition, as with the Word Definitions subtest discussed above, all measures used tested vocabulary words that were not specifically taught throughout the programme. Similar results were found in another study also using a collaborative, whole school language intervention approach, where students improved on only researcher-developed measures of vocabulary, not on standardized vocabulary measures, possibly for the same reasons (Lesaux et al 2010).

The treatment group, when analysed separately, significantly improved from Time 1 to Time 2 on both RS and SS versions of all measures, including the two measures not showing significant interaction effects between treatment and time (Tables 1 and 3). It is not clear whether improvement on these two measures, or on SS versions of the measures, was due to treatment, maturation (Jackson 2008), or possibly other unknown factors. Attendance and treatment fidelity measures were taken for the treatment group. Most students were present for each of the 12 sessions, and only very few students were reported to have found one or two of the sessions difficult. Consequently, these factors were not thought to influence the students’ amount of improvement on selected measures.

The control group, when analysed separately, significantly improved on both RS and SS versions of three out of five measures, which suggests that there may have been an expected maturation effect (Jackson 2008). However, the control group did not improve significantly on the other two measures (Word Classes Expressive (RS and SS versions) and Word Associations RS) (Tables 2 and 4). This is in contrast to the treatment group, whose participants improved on all RS and SS versions of the measures (as stated above). Again, results of the data analyses comparing the treatment and control groups showed that treatment was effective for improving the treatment group’s participants’ vocabulary skills.
on the RS versions of these two measures (Word Classes Expressive and Word Associations), but there were no significant differences in scores between the treatment and control groups for the SS version of Word Classes Expressive. However, because results of the analyses of the treatment and control groups separately showed that the treatment group significantly improved on the SS version of Word Classes Expressive and the control group did not, one could speculate that treatment may have had some effect in improving participants’ scores on this measure. This cannot be determined for certain, however, as the difference in the means between the two groups could have been influenced by factors other than treatment (Polgar & Thomas 2000).

Overall, the results of the current study support the findings in other studies that have shown that a collaborative whole school language intervention approach is effective in improving language skills specifically in adolescents identified with LI (Starling et al 2012), in adolescents in low performing urban middle schools with high numbers of LM students (Lesaux et al 2010), and in younger children (Throneburg et al 2000; Nippold 2011; McIntosh et al 2007). However, to the author’s knowledge, the current study is the only RCT design study that has shown the effectiveness of a collaborative whole school vocabulary intervention programme for improving vocabulary skills (on certain receptive and expressive vocabulary measures), in secondary school students, not identified with LI, from schools in socially disadvantaged areas. In addition, other studies have shown that the use of instructional strategies for vocabulary learning employed in the current study, such as mind mapping, word-building, word associations, and context clues, has been shown to be effective in improving adolescents’ vocabulary skills (Fukkink & de Glopper 1998; Stahl & Fairbanks 1986). Results of the current study suggest that these instructional strategies, implemented using a collaborative whole school vocabulary intervention approach, are effective in improving adolescents’ vocabulary skills on RS versions of three vocabulary measures.

4.2 Clinical Significance of the Findings

While the treatment programme had a statistically significant effect on improving participants’ raw scores on three vocabulary measures in the current study, determining the clinical significance of these findings proves difficult. There are many ways to determine
clinically significant change (Bothe & Richardson 2011). One way is to determine whether movement from a dysfunctional range to a functional range, on the measure of interest, has occurred (Bothe & Richardson 2011; Jacobson et al 1984). Participants in the current study were students in schools from areas of social disadvantage. While research has established that a correlation between language difficulties and social disadvantage exists (Spencer et al 2012), participants were not identified as either having LI (in a dysfunctional range) or not, and were likely to have varying degrees of language ability. For these reasons, it is difficult to determine the clinical significance of the findings by whether the treatment group, as a whole, moved from a dysfunctional range to a functional one.

Another way to determine the clinical significance of the findings is to conclude whether the participants judge the changes that occurred to be important in how they feel or function (Bothe & Richardson 2011). In the current study, participants were not asked whether or not they felt that they had made any important or functional changes with regards to their vocabulary skills as a result of the vocabulary programme. Therefore, with the above points in mind, the clinical significance of the findings in the current study cannot be definitively determined.

4.3 The Relationship between SEBD and Amount of Improvement

Other studies have shown that a relationship exists between higher levels of SEBD and language difficulties (Joffe & Black 2012; Durkin & Conti-Ramsden 2007; Clegg et al 2005; Lindsay et al 2007; Wadman et al 2008; Durkin & Conti-Ramsden 2010; Lindsay & Dockrell 2008; Lindsay & Dockrell 2012). Consequently, the researchers of the current study hypothesized that there would be a relationship between higher levels of SEBD (measured by higher Overall Stress scores on teacher rated SDQs) and a lower amount of improvement on selected vocabulary measures.

Results of the current study showed that there were significant moderate negative correlations between higher levels of SEBD and a lower amount of improvement on the RS and SS versions of Word Classes Expressive, and on the RS version of Word Definitions. There were only small or very weak negative correlations and one very weak positive correlation (Word Associations RS) between SEBD and amount of improvement on the remaining measures. Negative correlations found support the researchers’ hypothesis that a
relationship between higher levels of SEBD and a lower amount of improvement on selected vocabulary measures exists.

While predicted negative correlations were found, none of them were considered to be strong correlations. The most prominent correlations (while still only moderate) showed a relationship between higher levels of SEBD and a lower amount of improvement on expressive measures of vocabulary (Word Classes Expressive and Word Definitions). These correlations were found to be significant, which indicates that it is unlikely that they were due to chance (Brace et al 2009). Similar results were found in a study by Joffe and Black (2012), where students with lower expressive language ability reported greater difficulties on the SDQ than students with average language ability. However, in contrast to the current study, they also found that students with lower receptive language ability reported greater difficulties on the SDQ than students with average language ability (Joffe & Black 2012). In addition, it is important to note that Joffe and Black (2012) aimed to find correlations between students’ language ability and higher levels of SEBD, while the current study only aimed to find correlations between students’ amount of improvement (not ability) on certain language measures, and higher levels of SEBD.

Many studies employ different assessment and measurement procedures for determining levels of SEBD, which accounts for a wide variety of different findings in the literature (Joffe & Black 2012). Some studies have found strong relationships between higher levels of SEBD and language difficulties, using various combinations of reports from students, parents, and teachers (Joffe & Black 2012; Durkin & Conti-Ramsden 2007; Clegg et al 2005; Lindsay et al 2007). Lindsay et al (2007) and Joffe and Black (2012) both highlight the fact that teachers tend to rate SEBD levels lower than parents or students. The teachers in the current study could have underestimated students’ levels of SEBD on the SDQs and this may be a possible explanation for evidence of only moderate and small/very weak correlations between higher levels of SEBD and a lower amount of improvement on selected vocabulary measures. However, the relationship between SEBD and language difficulties is not straightforward, and there are mixed findings in many studies (Joffe & Black 2012). In addition, correlations do not imply causation (Pallant 2007), and research has not yet established whether language difficulties cause SEBD or vice versa (Joffe & Black 2012). It is possible that
correlations found between SEBD and language difficulties may also be influenced by other factors (Pallant 2007).

The area of research into the relationship between higher levels of SEBD and language difficulties is still developing, and further research is needed. However, results of the current study add to this area’s developing body of research and suggest that under the current study’s conditions, significant moderate negative correlations exist between higher levels of SEBD and a lower amount of improvement on certain expressive vocabulary measures.

4.4 Limitations and Future Recommendations

Though the results of the main outcomes in this study are promising, there are several limitations with the study’s design. Firstly, double blinding was not ensured. Although the researchers were blind to how much improvement individual students made, the researchers knew which students were getting the intervention and which students were not. Additionally, the students getting the intervention were also aware that they were receiving a vocabulary intervention programme. The absence of double blinding can yield exaggerated estimates of treatment effects (Sibbald & Roland 1998), and this must be taken into consideration when interpreting the results of the current study.

Secondly, participants were chosen by convenience sampling, and only first year students were included. Although the participants were thought to be representative of a wider population of secondary school students in schools in areas of social disadvantage, it cannot be determined for certain (Polgar & Thomas 2000). Therefore, one can only state that the treatment approach used in the study is indicative, not definitive, of being effective for improving skills on RS versions of three measures of vocabulary for this population (Polgar & Thomas 2000). This is a limitation of the study, as there is a possibility that the results of the study may not be generalizable to other secondary school students in schools in areas of social disadvantage, or to other secondary school students across different age groups.

In addition to the limitations of the study design, the results of the study raise questions that require further investigation. First, as discussed above, there may be several reasons for why there were no significant differences in scores between the treatment and control groups on SS versions of the measures. One possible explanation may be that measures of vocabulary
knowledge were employed in the current study. Further studies using more sensitive measures for testing participants’ abilities to employ strategies (used in the intervention programme) for vocabulary learning are recommended.

Second, future research is needed to determine the clinical significance of the findings, as this proves difficult (discussed above). Determining the clinical significance of the findings of the current study, specifically, would require further research into whether or not the participants felt that they had made functional improvements in their vocabulary skills as a result of the vocabulary programme (Bothe & Richardson 2011).

Another possible way to determine the clinical significance of the findings would be to conclude whether movement from a dysfunctional to functional range occurred (Bothe & Richardson 2011). In the current study, determining the clinical significance of the findings in this manner proves difficult, primarily because students were not identified as having LI or not. Future studies are recommended to determine the effectiveness of the vocabulary intervention programme employed in the current study for improving vocabulary skills in adolescents identified with LI, in secondary schools in areas of social disadvantage. Determining whether adolescents with LI move from a dysfunctional range to a functional one using this specific intervention approach will provide insight into the effectiveness of the programme with this population, and the clinical significance of the findings of future studies. These findings may hold important clinical implications for SLTs working with and supporting adolescents with LI.

4.5 Conclusion

The results of the current study showed that treatment was successful in improving participants’ raw scores on three vocabulary measures. These results suggest that a 12 week-long, collaborative whole school vocabulary intervention approach using instructional strategies for vocabulary learning is a promising approach for improving vocabulary skills (on certain vocabulary measures) in secondary school students, not identified with LI, from schools in socially disadvantaged areas. This study’s findings contribute to the limited body of evidence for supporting adolescents in main stream schools in areas of social disadvantage, and hold clinical implications specifically for SLTs and teachers working with this population.
5. Acknowledgements

I would like to thank Professor Sue Franklin for her continued mentoring, guidance and support.

Thanks to Aoife Murphy for helping to facilitate this research project, and for her continued advice and support.

Thanks to the teachers and students for participating in the study.

Thanks to the other student SLT members of this research project: Aoife McNamara, Anne Marie Breen, Áine Bogue, Eimear Greene, and Erica McBurney.
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Appendices

Appendix 1: ‘Information for Students’ leaflet and student consent form

Appendix 2: ‘Information for Parents’ leaflet and parent consent form

Appendix 3: Table of independent t-tests comparing treatment group vs control group scores at Time 1

Appendix 4: Table of non-significant results for RS versions of the measures

Appendix 5: Table of non-significant results for SS versions of the measures
Appendix 1

Information for Students: Vocabulary Assessment

Research Project: Measuring the efficacy of a whole class intervention to improve vocabulary learning skills in post-primary school students

What is this about?
You are being asked to complete an assessment for identifying the vocabulary learning skills of teenagers.

This will be used as part of a research project on teaching vocabulary learning skills in post-primary schools.

What do I have to do?
You are being asked to complete a vocabulary assessment with the research speech and language therapy students. This will take 15 minutes.

What if I do not want to take part?
You can decide to not take part at any time and we WILL NOT use your information in the project.

What happens to the information?
- The information will be written down by the speech and language therapist.
- All the information you give the Speech and Language Therapist is kept in a locked filing cabinet.
- Nobody can read this information except the Speech and Language Therapists working on the project.
- The information collected will be kept on the main researcher’s computer, which will have a password to protect it.

There will be NO information about your name, date of birth, address or school in the research.

What happens if something goes wrong?
In the unlikely event that something goes wrong during the assessment session, the assessment will immediately stop until the researcher and students are ready to start again or the session would be stopped completely.
How does this help you?
The information will help teachers, speech and language therapists and others to understand how difficult school is for students who find it hard to learn new words and use new words and sentences as well as understand what you read.

What are the risks?
You might find some questions difficult or feel uncomfortable with some of the questions in the assessment. If this happens you can stop the assessment or refuse to answer the question.

Who else is taking part?
Approximately twenty-four 12-14 year old students from your area will be asked to complete the assessment.

What happens at the end of the study?
• At the end of the study the information will be used to present results but the information here will have no names, school names or any other information about you.

• The information will be written up and may be published on the internet.

• All subject detail/information and data will be held by the principal investigator for up to 7 years in a password-protected computer.

• The results of the project will be available to you if you write a letter to the speech and language therapists working in the project.

What if I have more questions or do not understand something.
If you do not understand something during the assessment you can ask the researcher at any time.

What if I change my mind during the study?
If you change your mind during the study, you can ask for your information not to be included in the research. You can decide if you want your information included or not.
STUDENT PARTICIPANT INFORMED CONSENT FORM

Title of Project: Measuring the efficacy of a whole class intervention to improve vocabulary learning skills in post-primary school students

Should you agree to participate in this study please read the statements below and if you agree to them, please sign the consent form.

- I have read and understood the participant information sheet.
- I understand what the project is about, and what the results will be used for.
- I understand that what the researchers find out in this study may be shared with others but that my name will not be given to anyone in any material developed.
- I am fully aware of all of the procedures involving myself, and of any risks and benefits associated with the study.
- I know that my participation is voluntary and that I can withdraw from the project at any stage without giving any reason.

I agree to my involvement in this research project after agreeing to all the above statements.

Name: (please print): __________________________
Signature: _________________________________ Date: ____________
Witness Signature ___________________________ Date: __________
Investigator’s Signature ______________________ Date: __________
Appendix 2

Information for Parents: Vocabulary Assessment

Research Project: Measuring the efficacy of a whole class intervention to improve vocabulary learning skills in post-primary school students

What is this about?
Your son/daughter is being asked to complete an assessment for identifying the vocabulary learning skills of teenagers.

This will be used as part of a research project on teaching vocabulary learning skills in post-primary schools.

What do I have to do?
Your son/daughter is being asked to complete a vocabulary assessment with the research speech and language therapy students. This will take 15 minutes.

What are the benefits of the study for your son/daughter?
The information from the assessments will be used to help teachers, speech and language therapists and others to identify if the programme helps students improve their vocabulary and ability to learn new words.

What are the risks of the study for your son/daughter?
Your son/daughter might find some questions difficult or feel uncomfortable with some of the questions in the assessment. If this happens the assessment will be stopped or the question skipped.

Who else is taking part?
Approximately twenty four 12-14 year old students from your area will be asked to complete the assessment.

What if something goes wrong?
In the unlikely event that something goes wrong during the assessment session, the assessment will immediately stop until the researcher and students are ready to start again or the session would be stopped completely.
What happens to the information?
The information about your son/daughter's progress in the programme will be included in research completed through the University of Limerick:

- This information will be written down, recorded and kept in a locked filing cabinet.
- The information will be analysed and written up for publication in a journal for people to read.
- NO identifying information will be printed in the research: Your son/daughter's name, date of birth, address or school name will NOT be written in the research.

What happens at the end of the study?

- At the end of the study the information will be used to present results but the information will be completely anonymised.
- All data gathered from the research will be held by the principal investigator for up to 7 years in a password-protected computer.
- The results of the final year project will be available to participants on written request to the Principal Investigator.

What if I have more questions or do not understand something?
You can contact either of the investigators at any time during the study.

What happens if I change my mind during the study?
You can choose if you want your son/daughter to be included in the research. You can withdraw your son/daughter from the research at any time. Your son/daughter can still be included in the programme even if you do not wish them to be included in the research.
Title of Project: Measuring the efficacy of a whole class intervention to improve vocabulary learning skills in post-primary school students

I give consent for my/our son/daughter to be involved in the above research

- I have read and understood the parent/carer information sheet.
- I understand what the study is about, and what the results will be used for.
- I consent for the data to be used anonymously in report format and published output.
- I am fully aware of all of the procedures involving my child, and of any risks and benefits associated with the study.
- I know that my child’s participation is voluntary and that I can withdraw my child’s participation in the study at any stage without giving any reason.

For the Parent/Guardian

I permit consent for __________________________ (name of child) to participate in the above study.

Name of child: (please print): __________________

Name of parent/carer: (please print): ________________

Parent Signature: ____________________________ Date: __________

Investigator’s Signature ____________________________ Date: __________
### Appendix 3

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Mean Treatment Group</th>
<th>Mean Control Group</th>
<th>SD Treatment Group</th>
<th>SD Control Group</th>
<th>Mean Difference</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Classes Receptive RS Time 1</td>
<td>12.423</td>
<td>12.490</td>
<td>4.0205</td>
<td>4.3601</td>
<td>-.0668</td>
<td>-1.1383 to -1.0048</td>
<td>-1.1383</td>
<td>243</td>
<td>.902</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Classes Expressive RS Time 1</td>
<td>7.611</td>
<td>7.521</td>
<td>3.3626</td>
<td>4.0105</td>
<td>.0899</td>
<td>-.8458 to 1.0256</td>
<td>.189</td>
<td>243</td>
<td>.850</td>
<td>2 tailed</td>
</tr>
<tr>
<td>BPVS RS Time 1</td>
<td>124.785</td>
<td>124.052</td>
<td>17.8903</td>
<td>20.7407</td>
<td>.7332</td>
<td>-4.1792 to 5.6455</td>
<td>.294</td>
<td>243</td>
<td>.769</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Associations RS Time 1</td>
<td>45.738</td>
<td>48.719</td>
<td>11.2851</td>
<td>13.1643</td>
<td>-2.9805</td>
<td>-6.0881 to 1.1271</td>
<td>-1.889</td>
<td>243</td>
<td>.060</td>
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</tr>
<tr>
<td>Word Classes Receptive SS Time 1</td>
<td>7.416</td>
<td>7.375</td>
<td>3.1795</td>
<td>3.4466</td>
<td>.0411</td>
<td>-.8061 to .8883</td>
<td>.096</td>
<td>243</td>
<td>.924</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Word Classes Expressive SS Time 1</td>
<td>5.980</td>
<td>5.729</td>
<td>2.8391</td>
<td>3.2750</td>
<td>.2507</td>
<td>-.5271 to 1.0285</td>
<td>.635</td>
<td>243</td>
<td>.526</td>
<td>2 tailed</td>
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<tr>
<td>Word Definitions SS Time 1</td>
<td>6.054</td>
<td>5.990</td>
<td>2.8493</td>
<td>3.4054</td>
<td>.0641</td>
<td>-3.7346 to 0.8628</td>
<td>.158</td>
<td>243</td>
<td>.875</td>
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<tr>
<td>BPVS SS Time 1</td>
<td>82.99</td>
<td>83.58</td>
<td>12.843</td>
<td>13.059</td>
<td>-.590</td>
<td>-3.923 to 2.743</td>
<td>-.349</td>
<td>243</td>
<td>.728</td>
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</tbody>
</table>

*Independent t-tests comparing treatment group vs control group scores at Time 1*
Appendix 4

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Interaction Effect Within</th>
<th>Main Effect Within</th>
<th>Main Effect Between</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>p</td>
<td>F</td>
</tr>
<tr>
<td>Word Classes Receptive RS</td>
<td>(1,229)=1.338</td>
<td>0.249</td>
<td>(1,229)=33.629</td>
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<tr>
<td>Word Definitions RS</td>
<td>(1,229)=.315</td>
<td>0.575</td>
<td>(1,229)=28.427</td>
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</tbody>
</table>

RS versions of the measures showing non-significant interaction effects between treatment and time
## Appendix 5

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Interaction Effect Within</th>
<th>Main Effect Within</th>
<th>Main Effect Between</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>F (df) p</td>
<td>F (df) p</td>
<td>F (df) p</td>
</tr>
<tr>
<td>Word Classes Receptive SS</td>
<td>(1,229)= 0.687 0.408</td>
<td>(1,229)= 17.487 0.0001</td>
<td>(1,229)= 0.468 0.495</td>
</tr>
<tr>
<td>Word Definitions SS</td>
<td>(1,229)= 0.000 0.997</td>
<td>(1,229)= 22.798 0.0001</td>
<td>(1,229)= 0.323 0.570</td>
</tr>
<tr>
<td>BPVS SS</td>
<td>(1,229)= 1.69 0.195</td>
<td>(1,229)= 23.91 0.0001</td>
<td>(1,229)= 0.027 0.870</td>
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<tr>
<td>Word Classes Expressive SS</td>
<td>(1,229)= 3.124 0.078</td>
<td>(1,229)= 12.460 0.0001</td>
<td>(1,229)= 2.688 0.102</td>
</tr>
</tbody>
</table>

Four SS versions of the measures showing non-significant interaction effects between treatment and time.