Does a whole-class vocabulary intervention programme improve the vocabulary skills of secondary school students from areas of social disadvantage?

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Submitted by: Áine Bogue
Supervisor: Professor Sue Franklin
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To Dad, my kindred spirit, this is for you...
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Abstract

**Background:** Adolescents from socially disadvantaged areas typically have lower vocabulary skills when compared with their age-matched peers from areas of social advantage (Spencer *et al* 2012). These difficulties put them at greater risk of academic failure, low self-esteem (Bercow 2008) and SEBD (Joffe and Black 2012). Currently, there is limited research on whole-class vocabulary interventions targeting adolescents (Cirrin and Gillam 2008).

**Aims:** This research aims to determine whether a whole-class vocabulary intervention programme improves the vocabulary skills of secondary school students, measured on standardised measures, in areas of social disadvantage. A secondary aim is to investigate the relationship between pre-treatment scores and the amount of improvement made.

**Methods and Procedures:** 231 students from four socially disadvantaged schools took part, (M= 12;08). Schools were randomly assigned to Treated (n= 135) or Control groups (n=96.) All students were assessed on standardised measures, BPVS III (Dunn *et al* 2009) and vocabulary subtests from the CELF-4 (Semel *et al* 2003). The Treated group received twelve weeks of whole-class vocabulary intervention delivered by their teachers. The teachers were trained and supported by a SLTs. The Control group’s intervention was delayed.

**Outcomes and Results:** There were greater improvements for the Treated group for three raw score measures: BPVS, Word Classes Expressive and Word Associations. The effect sizes were considerably small. The Treated group significantly improved on all language measures across time, while the Control group did not. These results indicate that the Treated group made greater gains than the Control group. There were no significant interaction effects of treatment on all standard score measures. There was a moderate, negative correlation between the pre-treatment scores and the gains made.

**Conclusions and Implications:** The positive raw score results suggest that a whole-class vocabulary programme can improve aspects of vocabulary skills of students from areas of social disadvantage. The results also imply the lower the initial language level, the greater the gains made. However, the lack of change on all standard score measures warrants
investigation. Further research should also administer more sensitive assessments to determine which aspects of the intervention are most beneficial.

**Keywords:** vocabulary, whole-class intervention, adolescents, social disadvantage, collaboration.
Introduction

Adolescents’ language development is a time of complex transition, when vocabulary learning moves away from the concreteness of the word to deep and abstract meanings (Nippold 2007). This change in both language and cognition needs to be supported, but currently there is a lack of services for this population internationally (Reed 2005; Bercow 2008; Wilson et al. 2010; O’Leary and Gibbon 2012). The Irish Association of Speech and Language Therapists guidelines state that: “A Speech and Language Therapist works with a diverse range of clinical populations including children and adolescents...” (IASLT 2006, p.4) but presently adolescents are being neglected in Ireland.

The reasons why adolescents’ should receive intervention, focusing on vocabulary development, are laid out in this review. These include the complexity of adolescent language development; vocabulary development in adolescent language; the consequences of language difficulties; those at risk of language difficulties; service delivery in secondary schools; and currently available vocabulary programmes.

Adolescent language development:

While most language learning occurs in the early years of childhood (0-11) (Lenneberg, cited in Nippold 2007, p.25), there is still a significant quantity of language to be acquired post puberty right into adulthood (Nippold 2007; Hartshorne 2011). The language acquired during the adolescent years (13-18) invokes many complex cognitive skills including verbal reasoning, critical thinking, comprehending and expressing figurative language and social interaction (Nippold 2007; Hartshorne 2011). As adolescents grow and learn, they leave the concrete operational stage of thinking and embark on the formal operational stage (Larson and McKinley 2003; Paul and Norbury 2012) and as a result their understanding and use of language becomes more abstract than previously used. In comparison to early language development, adolescent language learning is gradual and unique to the individual. Nippold (2007) terms this as ‘linguistic individualism’, i.e. variation in adolescents’ lexicons due to their language developing
around specialized interests, e.g. mechanics, and as a result containing specific vocabulary, e.g. catalytic converter.

Adolescent language development includes understanding and producing complex instructions, problem-solving, complex vocabulary, producing narratives and using language in a social context (Hartshorne 2011). As well as new content, adolescents’ language learning environment and medium of learning is different from their younger peers. Most of their language is now acquired through educational settings and social experiences (Locke and Bogin 2006) rather than the home. The medium shifts from the oral to the literate end of the oral-literate continuum (Paul and Norbury 2012). These changes pose immediate problems for adolescents with language difficulties, as language difficulties are often associated with literacy issues (Snow et al, cited in Hartshorne 2011) and social difficulties (Hartshorne 2011). As a result, these students will struggle to acquire the more complex language needed to succeed in secondary school (Hartshorne 2011).

Adolescents’ vocabulary development:
Vocabulary development continues to grow and expand throughout adulthood, especially for the proficient readers (Nippold 2007). Adolescents are reported to acquire seven to ten new words a day (Hartshorne 2011; Nagy and Scott 2000) and these words are typically found in academic text rather than conversational speech (Nagy et al, cited in Nippold 2007, p.26). These words tend to be more abstract and less transparent than those acquired in the younger years and as a result, they require complex language skills such as contextual abstraction, i.e. using context clues to determine the meaning of unfamiliar words (Nippold 2007), and morphological analysis. These metalinguistic competencies are often weak in students with language difficulties (Paul and Norbury 2012).
Comprehending words with multiple meanings is another aspect of lexical development in the adolescent years (Nippold 1992). In the younger years, children typically focus on the physical properties of a word but in adolescence, word knowledge deepens and the psychological aspects of the word are expected to be acquired (Nippold 1992), but this is
not always the case. The student may have the word in their lexicon but their understanding of the meaning of the word may be incorrect, partial or insufficient. This concept of partial lexical development highlights the point that vocabulary learning is gradual and occurs through the life span (Nagy et al, cited in Nippold 2007, p.29).

As previously mentioned, literacy and lexical development are intricately related (Nippold 2007) and many students begin to develop reading difficulties in secondary school due to the level of complex vocabulary (Snow et al 2007). Hence, vocabulary instruction needs to be a key feature of the academic curriculum. Moreover, lexical development influences other areas of language development (Nippold 2007) and as a result, building adolescents’ vocabulary supports verbal reasoning, figurative language, narrative development and discourse.

**Students with Language Difficulties:**

For students with speech, language and communication needs (SLCN), the transition to secondary school can be overwhelming (Hartshorne 2011). The level of language being used and expected from them is far more complex and abstract. These students can be subdivided into two broad categories; a group with long term, persistent SLCN, e.g. Specific Language Impairment (SLI), and another group who have poor language skills due to social economic status (SES) and/or social, emotional and behavioural difficulties (SEBD) (Hartshorne 2011). Research states that the former will need constant, intensive support throughout their education including direct therapy (Larson and McKinley 2003). The latter group are more complex and the debate between ‘difference’ and ‘disorder’ is pertinent here. To distinguish between the two, Larson and McKinley (2003) argue that the assessment stage should consider the students’ environmental system. They state that students may have adequate language skills for their primary environment, and as a result they are at risk of being labelled with a language disorder that merely may be a difference. They claim that “assessment should...determine whether it is a disability that adversely affects academic performance and warrants special services” (2003, p.191).

What Larson and McKinley (2003) fail to consider is the set expectations in the academic setting. The language used in school does not adapt according to an individual’s primary environment or SES, and therefore students from low SES are typically going to be at a
greater disadvantage in comparison to middle or high SES when starting secondary school due to the level of new, complex language demands (Ginsborg 2006).

There is a third group that educators need to be cognisant of and that is the group with “hidden” SLCN (Hartshorne 2011). This group of students enter secondary level with no apparent language problems and it is not until the demands become overwhelming and they begin to fail academically, that their impairments e.g. SLI become apparent (Larson and McKinley 2003). Furthermore, SLCN may remain undetected if SEBD and/or literacy difficulties co-occur, as they may be more apparent (Joffe and Black 2012) and seen as priorities.

**Language and SES:**

There has been much research investigating the correlation between language abilities and SES (Ginsborg 2006; Hartshorne 2011; Spencer et al 2012, Lesaux et al 2010) and the main view is that students from low SES tend to demonstrate limited language abilities. Many reasons have been postulated for this: poverty; level of maternal education; the environment; interaction style of mother and child; quantity and/or quality of language to which the child is exposed (Ginsborg 2006). All of these reasons may be have some value but as of yet the relationships remain ambiguous. What is clear is that students from low SES are **at greater risk** of SLCN when compared to middle or high SES students (Spencer et al 2012; Peers et al 2000; Hart and Risley 1999; Walker et al 1994).

More specifically, language difficulties associated with low SES include poor narrative skills (Sage 2005), inappropriate register (Hartshorne 2011), and most notably, restricted vocabulary (Spencer et al 2012).

**SEBD and SLCN:**

As well as complex language development, social, emotional and behavioural changes occur in the years of adolescence (Blackmore 2008). Adolescents’ self- perception alters and they become highly aware of feelings, thoughts and their behaviour (Nippold 2007). Dependence on their peers and social interaction heightens and as a result, they attempt to alter their language abilities to include slang and jargon to feel socially accepted (Hartshorne 2011).
If these skills are not acquired, the adolescent’s ability to interact socially may be affected and this may lead to social exclusion (Snowling et al 2006). This in turn can lead to low self-esteem, inappropriate behaviour and academic failure (Bercow 2008). The long-term effects can include mental health issues, unemployment and relationship difficulties (Clegg et al 2005). Despite these findings, the relationship between SLCN and SEBD is not straightforward, and they do not always co-occur. Some research shows positive SEB outcomes despite SLCN being present (Carroll and Dockrell 2010; Conti-Ramsden and Botting 2008).

While SLCN and SEBD may not always coexist, it is clear from research, that students with SLCN are at greater risk of SEBD. Interestingly, Joffe and Black (2012), in their qualitative study which focused on interviewing parents and teachers about adolescents SEBD and SLCN, found that parents and teachers appeared to be more aware of the adolescents’ SEBD than the SLCN. Clearly, more emphasize needs to be placed on the high correlation between SEBD and SLCN.

**Service Delivery in Secondary Schools:**

While speech, language and communication development has been identified as a crucial process in adolescence, the resources to support it are still inadequate. Intervention for adolescents appears to be considered an extra (Larson and McKinley 2003) and something that can be cut from the budget. A UK survey (Lindsay et al 2002) of provision for adolescents with SLCN reported a lack of support in secondary schools and a more recent report (Bercow 2008) showed little change, despite the overwhelming evidence presenting the need. Due to this lack of support, the rights and needs of the student are being neglected and this is adding to their academic and social difficulties (Larson and McKinley 2003).

In an effort to overcome these service inadequacies, a collaborative model of intervention, i.e. teachers and speech and language therapists working together, has been supported in much of the literature (Paul and Norbury 2012; Wilson et al 2010; Ehren 2002; Nash 2009). It has been found to be a successful, effective, sustainable way of supporting students with SLCN (Nash 2009; Wilson et al 2010). The aim of the
collaborative model is to share and develop knowledge and skills across disciplines (Wilson et al. 2010). As this occurs, teachers and speech and language therapists can focus on developing core language skills through the curriculum. This then enables adolescents to receive targeted intervention while at school.

Once this collaborative style of intervention is established, a whole-class approach could be implemented. This too has been favoured in the literature for many reasons. Firstly, adolescents do not favour an individual pull-out model of intervention as it highlights their differences from their peers (Larson and McKinley 2003). Secondly, removing a student from class puts them at risk of missing out on information delivered in the classroom, putting them at greater risk of academic failure (Starling et al. 2012). Finally, as already mentioned, many SLCN remain undetected and by providing a whole-class approach, these students would directly receive intervention (Hartshorne 2011). A whole-class approach has been shown to benefit all adolescents’ communication and academic skills (Rowe and Topping 2007) and the evidence is increasing. Importantly, Dockrell and colleagues (2007) showed that a whole-class approach not only benefitted the students but it also altered the teachers’ methods of instruction and how they perceived communication difficulties.

**Vocabulary Programmes:**
A vocabulary-enriching programme, constructed by multiple professionals, targeting those at risk, delivered as a whole-class approach is clearly needed. Lesaux and colleagues (2010) attempted to develop such a programme and their outcomes were positive. While their study focused on reading comprehension outcomes, they employed both direct instruction i.e. teaching specific words, and indirect instruction, i.e. empowering students with strategies to decipher unfamiliar words independently. Quantitative outcomes showed that students scored higher on measures of vocabulary, word learning and reading comprehension. However, these results need to be considered with caution as the study implemented a ‘test-teach-retest’ design. While this can identify students’ skills and learning potential (Austin 2011), it neither determines the effectiveness of the intervention nor promotes
generalisation of new words. Positive reports from teachers indicate that the collaborative model was successful, but as these teachers were handpicked and all volunteered to take part a Rosenthal effect may have been created. Their study lacks blinding and as a result the standard of evidence is significantly decreased.

Research by Joffe (2011) is encouraging, providing positive outcomes on non-standardised tests of vocabulary measures post intervention. Joffe trained teaching assistants to deliver the programme, which included direct teaching of specific concepts and strategies including morphological analysis. One caveat of Joffe’s research was this was a small group intervention, targeting participants with language impairment, excluding the students who may have low language skills and undetected SLCN. As a result, this research failed to recognise the benefits of a whole-class approach to intervention.

The aim of this study was to determine whether a whole-class vocabulary programme improves socially disadvantaged secondary school students’ word knowledge and ability to decipher meaning from unknown words. A secondary aim was to determine whether initial language scores correlate with the amount of improvement made.
Methodology

Participants:

Participants were recruited by two National Behavioural Support Service (NBSS) speech and language therapists. Convenience sampling was used. All schools that obtain NBSS support in the Limerick region were asked to partake in the current research project. The first four schools that volunteered to partake were selected as the participants. The Principals in the four schools gave consent for the research to take place in their school. The research gained ethical approval from University of Limerick Research Ethics Committee.

All first year students in these schools were asked to partake in the research (n=247). Information sheets and consent forms were provided to carers and all students. 99% of carers (n=245) gave their consent. There were no exclusionary criteria; it was a population sample. The population contained students with English as an additional language (EAL) (n=31), varying language levels and SEBD. Students were not assessed for specific impairments e.g. SLI. The schools were gender specific, including three girls’ schools and one boys’ school, (n= 170:75 students respectively). This gender imbalance may have created a bias and undermined the population sampling.

At initial testing, Time 1, 245 students were assessed ranging in age from 11 to 15 years, (mean age 12;08). Due to varying reasons, 14 students were excluded from post intervention testing, Time 2, (total n=231 students).

Design:

A randomised control trial was chosen: each class was randomly assigned to ‘Treated’ versus ‘Control’ group. The Treated group consisted of 149 students and the Control group consisted of 96 students. Doubleblinding was not completed; neither the testers nor the students were blind to who received the intervention programme, threatening
the validity of the results. However, the testers were blind to the students’ change at Time 2 as each tester assessed different students at Time 1 and Time 2.

It was determined that a mixed-between repeated measures design was appropriate for this research as our aim was to compare the Treated and the Control groups’ scores from Time 1 to Time 2, assessing their change over time. The two independent variables were groups of students (Treated versus Control) and time (Time 1 pre intervention versus Time 2 post intervention). The dependent variables were the standardised language assessments. These were administered at Time 1 (pre scores) and Time 2 (post scores) and raw scores (RS) and standard scores (SS) were used in the analyses.

Procedure:

Assessment procedure:
Specific vocabulary assessments were chosen to provide accurate data on the students’ receptive and expressive vocabulary skills at word and sentence level. These included the British Picture Vocabulary Scale 3rd edition (BPVS III) (Dunn et al 2009) and three subtests from the Clinical Evaluation of Language Fundamentals 4th edition (CELF 4): Word Classes-Receptive and Expressive (WC Receptive and WC Expressive), Word Definitions (WD), Word Associations (WA) (Semel et al 2003).

The BPVS III is a standardised, norm-referenced (3;0 to 16;0 years) vocabulary assessment developed to assess the receptive vocabulary skills at word level. Reliability and validity are reported to be good (Dunn et al 2009). The student is presented with four pictures and asked to select one that matches a word produced verbally by the tester. Standard scores are calculated with a mean of 100 and a standard deviation of 15.

The CELF 4 is a standardised, norm-referenced (5;0 to 21;0 years) language battery. Reliability and validity are reported to be good (Semel et al 2003). From this the following vocabulary subtests were selected.
Word Classes Receptive subtest involves the participant choosing two words from four presented orally by the tester. This subtest assesses comprehension of the semantic connections between vocabulary items (Semel et al 2003). Word Classes Expressive requires the participant to explain why they chose the two words (from above). Its aim is to assess the participant’s ability to explain how words are linked (Semel et al 2003). These subtests assess a participant’s receptive and expressive vocabulary skills at word and sentence level. An example is given and three practice rounds are given. Standard scores are calculated with a mean of 10 and a standard deviation (SD) of 3.

The Word Definitions subtest presents the participant with a single word, then inserted in a sentence, and finally asked to define the word. It assesses the participant’s ability to verbally express the precise meaning of a word. An example is given and two practice words are presented initially. Standard scores are calculated with a mean of 10 and a standard deviation (SD) of 3.

In the Word Associations subtest the participant is given a category e.g. food and asked to name as many words as possible belonging to that category in sixty seconds. This aims to determine the semantic categories a participant has developed in their lexicon and also their ability to consciously retrieve these words (Semel et al 2003). An example is given initially. There is no standard score for this measure as it is criterion-referenced subtest.

**Intervention procedure:**
Prior to implementation of the intervention, seven English teachers and four resource support teachers were trained to implement the specific vocabulary programme. The participating teachers varied with respect to years of teaching experience and level of higher education, but this variation was comparable across the Treated and Control groups. The teachers were provided with a resource pack and set targets for each session. The two NBSS speech and language therapists visited the schools weekly and collaborated with the teachers closely. Teachers were interviewed after the programme
and asked to provide both positive and negative feedback (see Greene 2014; McBurney 2014).

The intervention consisted of an adapted, shortened version of the Vocabulary Enrichment Programme (VEP) (Joffe 2011). It involved ten target specific sessions and two revision sessions carried out twice weekly in forty-minute classes. The VEP’s aim is to “enhance the understanding and facilitate the expression of a wide range of basic and relevant concepts, meanings and vocabulary in students with SLCN in post-primary schools” (Joffe 2011). It teaches students strategies to enable them to understand and decode unfamiliar vocabulary independently, rather than directly teaching a list of vocabulary. These strategies include word associations, categorisation, mind mapping, grammar and multiple meaning words. See Appendix A for a full overview of the programme.

**Statistical Analyses:**

The assessment results were compiled into a data set and prepared for statistical analysis using *Statistical Package for the Social Sciences*, version 22 (SPSS 22). The set includes subtest scores from Time 1 (pre intervention) and Time 2 (post intervention). Each subtest provides a raw score (RS) and a standard score (SS), apart from Word Associations.

The data was tested for normality to analyse the distribution of the scores and it was noted that the data was not normal, (p<0.05). This suggests a violation to the assumption of normality but it was noted that this is less of an issue with large samples (Pallant 2007). Parametric tests were chosen as they are considered to be more robust and stringent than non-parametric tests (Pallant 2007).

As a precursor to the analyses carried out to determine the interaction effect between groups across time, Independent-Sample T-Tests were administered to determine if Treated and Control groups’ scores differed significantly at Time 1 testing. Mean scores were analysed and compared (see Table 1 in results section).
A Mixed Between-Within Design ANOVA was considered appropriate for this research as it aimed to test the impact of the two independent variables (group and time) on the dependent variables (vocabulary scores), i.e. to investigate the impact of intervention on vocabulary skills from Time 1 to Time 2 (time) while also comparing Treated versus Control groups (group).
As the data set was large, post-hoc Paired Sample T-Tests were administered to analysis each group from Time 1 to Time 2 separately. The critical probability p-value of <0.05 was used throughout the analyses to determine if the differences were considered statistically significant.

Correlation analysis was carried out to investigate the relationship between the pre-treatment scores and the amount of improvement made. The amount of improvement for each assessment measure was calculated by subtracting Time 1 and Time 2 scores for each participant in the Treated group.
Results

Independent Sample T-Tests compared the Treated and Control groups at Time 1. The results (Table 1) showed that there was no significant difference between the Treated and the Control groups’ pre scores on any of the measures, (p>0.05, 2 tailed).

Table 1: Treated Group versus Control Group scores at Time 1.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean Treated Group</th>
<th>Mean Control Group</th>
<th>Mean Difference</th>
<th>t</th>
<th>df</th>
<th>p value</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC Rec RS</td>
<td>12.423</td>
<td>12.490</td>
<td>0.0668</td>
<td>-.123</td>
<td>243</td>
<td>0.902</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WC Exp RS</td>
<td>7.611</td>
<td>7.521</td>
<td>0.0899</td>
<td>.189</td>
<td>243</td>
<td>0.850</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WD RS</td>
<td>16.738</td>
<td>16.823</td>
<td>0.0847</td>
<td>-.076</td>
<td>243</td>
<td>0.939</td>
<td>2 tailed</td>
</tr>
<tr>
<td>BPVS RS</td>
<td>124.785</td>
<td>124.052</td>
<td>0.7332</td>
<td>.294</td>
<td>243</td>
<td>0.769</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WA RS</td>
<td>45.738</td>
<td>48.719</td>
<td>2.9805</td>
<td>-1.88</td>
<td>243</td>
<td>0.060</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WC Rec SS</td>
<td>7.416</td>
<td>7.375</td>
<td>0.0411</td>
<td>.096</td>
<td>243</td>
<td>0.924</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WC Exp SS</td>
<td>5.980</td>
<td>5.729</td>
<td>0.2507</td>
<td>.635</td>
<td>243</td>
<td>0.526</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WD SS</td>
<td>6.054</td>
<td>5.990</td>
<td>0.0641</td>
<td>.158</td>
<td>243</td>
<td>0.875</td>
<td>2 tailed</td>
</tr>
<tr>
<td>BPVS SS</td>
<td>82.99</td>
<td>83.58</td>
<td>0.590</td>
<td>-.349</td>
<td>243</td>
<td>0.728</td>
<td>2 tailed</td>
</tr>
</tbody>
</table>

*= not significant
Main Treatment Effect:

Results from the raw score ANOVAs highlight that there were significant interaction effects between the Treated and the Control groups across time on three of five measures: BPVS, Word Classes Expressive, and Word Associations (see Table 2). The following looks at the subtests individually and presents visual representations of the mean changes (Figure 1, Figure 2 and Figure 3).

BPVS:
The BPVS results show that there was a significant interaction effect between Group and Time, Wilks Lambda=.97, F (1,229) =6.45, p=.012. The effect size is considered to be relatively small, partial eta squared =.027, indicating a small difference between groups’ across time (Cohen 1988, as cited in Pallant 2007). There was a substantial main effect for time when the groups are analysed together, Wilks’ Lambda =.843, F (1,229)= 42.74, p< .000, partial eta squared =.16. This indicates that there was an increase in scores across the two time periods.

![BPVS Raw Score Results across Time.](image)

Figure 1: BPVS Raw Score Results across Time.
**WC Expressive:**
The Word Classes Expressive results produced a significant interaction between Group and Time, Wilks Lambda=.97, F (1,229) =6.06, p=.015. The effect size, partial eta squared = .026 indicates a relatively small difference between the groups’ across time (Cohen 1988, as cited in Pallant 2007). There was a substantial main effect for time when the groups are analysed together, Wilks’ Lambda =.89, F (1,229)= 26.70, p< .000, partial eta squared =.10. This indicates that there was an increase in scores across the two time periods.

![Figure 2: Word Classes Expressive Raw Score Results across Time](image)

**Word Associations:**
The Word Associations results illustrate that there was a significant interaction between Group and Time, Wilks Lambda=.97, F (1,229) =6.81 p=.01. The effect size, partial eta squared = .029, indicates a small difference between the groups’ scores across time (Cohen 1988 as cited in Pallant 2007). There was a substantial main effect for time when the groups are analysed together, Wilks’ Lambda =.94, F (1,229)= 14.73, p= .000, partial eta squared =.06. This indicates that there was increase in scores across the two time periods.
There were no significant interaction effects on two subtests raw scores measures: Word Classes Receptive and Word Definitions. Moreover, there were no significant interaction effects on all the subtests standard scores, \( p > .05 \). This indicates that there was no significant difference between groups’ scores across time on any of these measures (see Table 3).

From the above ANOVAs, we can state that there was a significant improvement from Time 1 to Time 2 on three of the five vocabulary measures when the groups are analysed together. The effect sizes were considered small, indicating a marginal difference between groups across time. Post hoc Paired Sample T-Tests were run to analyse the Treated and Control groups’ scores separately from Time 1 to Time 2.
Table 2: Significant treatment effects between groups across time.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Main Interaction Effect</th>
<th>Main Effect for Time</th>
<th>Main Effect between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WL</td>
<td>F</td>
<td>p</td>
</tr>
<tr>
<td>BPVS RS</td>
<td>.97</td>
<td>(1,229)= 6.45</td>
<td>.012</td>
</tr>
<tr>
<td>WC Expressive</td>
<td>.974</td>
<td>(1,229)= 6.062</td>
<td>.015</td>
</tr>
<tr>
<td>WA</td>
<td>.971</td>
<td>(1,229)= 6.81</td>
<td>.010</td>
</tr>
</tbody>
</table>
Table 3: No treatment effects between groups across time.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Main Interaction Effect</th>
<th>Main Effect for Time</th>
<th>Main Effect between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WL F p (\eta^2)</td>
<td>WL F p (\eta^2)</td>
<td>F p (\eta^2)</td>
</tr>
<tr>
<td>BPVS SS</td>
<td>.99 (1,229)= 1.69 0.195 .007</td>
<td>.905 (1,229)= 23.91 0.0001 .095</td>
<td>(1,229)= 0.870 .000</td>
</tr>
<tr>
<td>WC Expressive SS</td>
<td>.987 (1,229)= 3.124 0.078 .013</td>
<td>.948 (1,229)= 12.460 0.0001 .052</td>
<td>(1,229)= 0.102 .012</td>
</tr>
<tr>
<td>WC Receptive RS</td>
<td>.994 (1,229)= 1.338 0.249 .006</td>
<td>.872 (1,229)= 33.629 0.0001 .128</td>
<td>(1,229)= 0.514 .002</td>
</tr>
<tr>
<td>WC Receptive SS</td>
<td>.997 (1,229)= .687 0.408 .003</td>
<td>.929 (1,229)= 17.487 0.0001 .071</td>
<td>(1,229)= 0.495 .002</td>
</tr>
<tr>
<td>WD RS</td>
<td>.999 (1,229)= .315 0.575 .001</td>
<td>.890 (1,229)= 28.427 0.0001 .110</td>
<td>(1,229)= 0.665 .001</td>
</tr>
<tr>
<td>WD SS</td>
<td>1.00 (1,229)= .000 0.997 .000</td>
<td>.909 (1,229)= 22.798 0.0001 .091</td>
<td>(1,229)= 0.570 .001</td>
</tr>
</tbody>
</table>
**Paired-Sample T-tests:**

There were significant differences in the Treated groups’ raw scores from Time 1 to Time2 on all vocabulary measures p< .05, 2 tailed (see Table 4). This indicates that the Treated group significantly improved on all language subtests across time after twelve weeks of intervention.

**Table 4: Change in raw scores across time of the Treated Group.**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (M)</th>
<th>SD</th>
<th>Mean Diff</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC Rec Pre vs. Post</td>
<td>12.552 (Pre)</td>
<td>3.9569 (Pre)</td>
<td>-1.1748</td>
<td>Between -1.6066 and -.7431</td>
<td>-5.379</td>
<td>142</td>
<td>.0001*</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WC Exp Pre vs. Post</td>
<td>7.671 (Pre)</td>
<td>3.3751 (Pre)</td>
<td>-1.5385</td>
<td>Between -2.0608 and – 1.0162</td>
<td>-5.823</td>
<td>142</td>
<td>.0001*</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WD Pre vs. Post</td>
<td>17.056 (Pre)</td>
<td>7.7802 (Pre)</td>
<td>-1.9371</td>
<td>Between -2.7405 and -1.1336</td>
<td>-4.766</td>
<td>142</td>
<td>.0001*</td>
<td>2 tailed</td>
</tr>
<tr>
<td>BPVS Pre vs. Post</td>
<td>125.04 (Pre)</td>
<td>17.730 (Pre)</td>
<td>-4.3357</td>
<td>Between -5.5479 and -3.1234</td>
<td>-7.070</td>
<td>142</td>
<td>.0001*</td>
<td>2 tailed</td>
</tr>
<tr>
<td>WA Pre vs. Post</td>
<td>45.825 (Pre)</td>
<td>11.325 (Pre)</td>
<td>-3.6993</td>
<td>Between -5.1741 and -2.2245</td>
<td>-4.959</td>
<td>142</td>
<td>.0001*</td>
<td>2 tailed</td>
</tr>
</tbody>
</table>

*= are significant
The Control groups’ results (Table 5) show significant differences on three raw score measures: Word Classes Receptive, Word Definitions and BPVS, p < .05, 2 tailed.

Table 5: Change in raw scores across time of the Control Group.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (M)</th>
<th>SD</th>
<th>Mean Diff</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC Rec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs.</td>
<td>12.398</td>
<td>4.3748</td>
<td>-0.7841</td>
<td>Between</td>
<td>-3.217</td>
<td>87</td>
<td>.002*</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Post</td>
<td>13.182</td>
<td>4.4838</td>
<td></td>
<td>-1.2686 and -0.2996</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WC Exp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs.</td>
<td>7.477</td>
<td>4.0028</td>
<td>-0.5455</td>
<td>Between</td>
<td>1.930</td>
<td>87</td>
<td>.057</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Post</td>
<td>8.023</td>
<td>4.1161</td>
<td></td>
<td>-1.1073 and 0.0164</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs.</td>
<td>16.750</td>
<td>9.1227</td>
<td>-1.5682</td>
<td>Between</td>
<td>3.040</td>
<td>87</td>
<td>.003*</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Post</td>
<td>18.318</td>
<td>9.7421</td>
<td></td>
<td>2.5936 and -0.5428</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs.</td>
<td>48.352</td>
<td>12.588</td>
<td>-1.9091</td>
<td>Between</td>
<td>0.861</td>
<td>87</td>
<td>.392</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Post</td>
<td>49.057</td>
<td>13.6174</td>
<td></td>
<td>-3.2993 and -0.5189</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPVS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs.</td>
<td>124.148</td>
<td>20.164</td>
<td>-0.7045</td>
<td>Between</td>
<td>2.73</td>
<td>87</td>
<td>.008*</td>
<td>2 tailed</td>
</tr>
<tr>
<td>Post</td>
<td>126.057</td>
<td>20.831</td>
<td></td>
<td>-2.3306 and 0.9216</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*= are significant
The Treated group’s standard scores showed a statistically significant improvement on all language measures from Time 1 to Time 2, p< .05, 2 tailed (see Table 6).

**Table 6: Change in standard scores across time of the Treated group.**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (M)</th>
<th>SD</th>
<th>Mean Diff</th>
<th>95% C.I.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WC Receptive SS Pre vs. Post</strong></td>
<td>7.510 (Pre) 7.224 (Pt)</td>
<td>3.1464 (Pre) 3.3764 (Pt)</td>
<td>-.7133</td>
<td>Between -1.0754 and -.3512</td>
<td>-3.894</td>
<td>142</td>
<td>.0001</td>
<td>2 tailed</td>
</tr>
<tr>
<td><strong>WC Expressive SS Pre vs. Post</strong></td>
<td>6.035 (Pre) 6.923 (Pt)</td>
<td>2.8443 (Pre) 3.0352 (Pt)</td>
<td>-.8881</td>
<td>Between -1.3229 and -.4533</td>
<td>-4.038</td>
<td>142</td>
<td>.0001</td>
<td>2 tailed</td>
</tr>
<tr>
<td><strong>WD SS Pre vs. Post</strong></td>
<td>6.175 (Pre) 6.755 (Pt)</td>
<td>2.8217 (Pre) 3.0724 (Pt)</td>
<td>-.5804</td>
<td>Between -.8717 and -.2892</td>
<td>-3.939</td>
<td>142</td>
<td>.0001</td>
<td>2 tailed</td>
</tr>
<tr>
<td><strong>BPVS SS Pre vs. Post</strong></td>
<td>83.09 (Pre) 85.853 (Pt)</td>
<td>12.748 (Pre) 12.9288 (Pt)</td>
<td>-2.7622</td>
<td>Between -3.8974 and -1.6271</td>
<td>-4.810</td>
<td>142</td>
<td>.0001</td>
<td>2 tailed</td>
</tr>
</tbody>
</table>

* = are significant
The Control group’s standard scores showed a statistically significant improvement from Time 1 to Time 2 on three of the four standard score subtests—Word Classes Receptive, Word Definitions and BPVS (See Table 7).

**Table 7: Change in standard scores across time of the Control group.**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Mean</th>
<th>SD</th>
<th>Mean Diff</th>
<th>95% C.I.</th>
<th>t</th>
<th>p</th>
<th>Tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC Receptive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs. Post</td>
<td>7.330 (Pre)</td>
<td>3.4632 (Pre)</td>
<td>-0.4773</td>
<td>Between -0.8899 and -0.0646</td>
<td>2.29</td>
<td>.024*</td>
<td>2 tailed</td>
</tr>
<tr>
<td></td>
<td>7.807 (Pt)</td>
<td>3.719 (Pt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WC Expressive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs. Post</td>
<td>5.705 (Pre)</td>
<td>3.2806 (Pre)</td>
<td>-0.2955</td>
<td>Between -0.7612 and 0.1703</td>
<td>1.261</td>
<td>.211</td>
<td>2 tailed</td>
</tr>
<tr>
<td></td>
<td>6.000 (Pt)</td>
<td>3.3114 (Pre)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs. Post</td>
<td>5.943 (Pre)</td>
<td>3.3196 (Pre)</td>
<td>-0.5795</td>
<td>Between -0.9700 and -0.1891</td>
<td>2.950</td>
<td>.004*</td>
<td>2 tailed</td>
</tr>
<tr>
<td></td>
<td>6.523 (Pt)</td>
<td>3.5493 (Pt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPVS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre vs. Post</td>
<td>83.39 (Pre)</td>
<td>12.937 (Pre)</td>
<td>-1.6023</td>
<td>Between -2.8955 and -0.3090</td>
<td>2.463</td>
<td>.016*</td>
<td>2 tailed</td>
</tr>
<tr>
<td></td>
<td>84.989 (Pt)</td>
<td>14.4941 (Pt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*= are significant

**ANOVA and Paired T test:**

When analysing the ANOVA and the Paired-Sample T-Tests together, it is clear that the Treated group made greater gains than the Control group on all language measures after twelve weeks of vocabulary intervention. As there was no significant difference between the groups’ to begin, it would suggest that the change in the Treated group could be attributed to the intervention. However, the interaction effects produced on the BPVS,
Word Classes Expressive and Word Associations raw scores were considered to be small, .27, .26, and .29 respectively (Cohen 1988, as cited in Pallant 2007), therefore the gains are relatively small.

Standard Scores:
The lack of significant interaction effects on the ANOVA standard score measures when compared to the significant interaction effects on the Paired T-tests needs further investigation.

Correlations:
The relationship between the amount of improvement (on all the language measures) and the pre-treatment scores were investigated using the Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There were moderate, negative correlations between the amount of improvement and the pre-treatment scores on four of the five subtests, see Table 8.

<table>
<thead>
<tr>
<th>Measure</th>
<th>r</th>
<th>n</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC Receptive RS</td>
<td>-.328</td>
<td>143</td>
<td>.000*</td>
</tr>
<tr>
<td>WC Expressive RS</td>
<td>-.342</td>
<td>143</td>
<td>.000*</td>
</tr>
<tr>
<td>WD RS</td>
<td>-.139</td>
<td>143</td>
<td>.098</td>
</tr>
<tr>
<td>WA RS</td>
<td>-.344</td>
<td>143</td>
<td>.000*</td>
</tr>
<tr>
<td>BPVS RS</td>
<td>-.320</td>
<td>143</td>
<td>.000*</td>
</tr>
</tbody>
</table>

*= are significant.
Discussion

This research aims to determine whether a whole class vocabulary programme improves the vocabulary skills of secondary school students in areas of social disadvantage. A secondary aim is to investigate the relationship between pre-treatment scores and the amount of improvement made. Within this section the research’s results will be discussed and compared with current research, before examining the limitations of the design and possible contributions of this research.

As a precursor to the analyses of the main effect of treatment, Independent-Sample T-Tests were carried out to determine if the groups differed significantly at Time 1. The results (Table 1 in results section) indicate there were no significant differences starting out and therefore selection errors cannot be considered a threat to the main results (Pallant 2007).

**Raw Scores:**

From the ANOVA results, it can be seen that the Treated group improved significantly more than the Control group on three of five measures: BPVS, Word Classes Expressive and Word Associations. The effect sizes were small, but promising. These results illustrate that aspects of both receptive vocabulary skills (at word level) and expressive vocabulary skills (at word and sentence level) significantly improved after 12 weeks of strategy-focused intervention. Students developed a broader, deeper knowledge of the meaning of words, a stronger ability to define semantic connections and a deeper knowledge of semantic categories. These findings are consistent with Joffe (2011) who found that students’ vocabulary skills significantly improved after 6 weeks of indirect vocabulary intervention.

Our research findings have clinical significance as the above skills are vital to successful adolescent vocabulary development (Nippold 2007). As mentioned in the introduction, partial lexical development in adolescence may hinder academic success (Nippold 2007) and therefore by broadening and deepening a students’ lexicon they are enabled to
understand and succeed more efficiently in school. The ability to explain semantic connections and create large semantic categories strengthens a student’s lexicon and their word fluency (Paul and Norbury 2012). Practically, these skills are invaluable in acquiring the large quantity of new vocabulary delivered to students daily, which in turn deepens comprehension and academic success.

There were no significant interaction effects of intervention on two subtests: Word Classes Receptive and Word Definitions. Word Classes Receptive requires the student to understand the specific meaning of four words and to choose two that best represent the desired relationship. The Word Definitions subtest presents specific vocabulary and asks the student to define the word descriptively (Semel et al 2003). Both subtests require a deep knowledge of specific vocabulary and as the intervention did not focus on direct vocabulary instruction, it can be postulated that gains were not made on these subtests as a result.

**Standard Scores:**
There were no significant interaction effects between groups and time on any of the standard score measures seen from the ANOVAs. One plausible reason for the lack of significant differences may be due to the significantly small effect sizes produced for these variables (see Table 2, Results section). Another possibility is that the standard scores were not sufficiently sensitive to change over a short time (Flippo and Caverly 1999) as Time 1 and Time 2 testing were within four months.

Interestingly, other research that produced positive outcomes on raw score measures when assessing the language skills of adolescents (Joffe 2011; Lesaux et al 2010) also did not find significant differences on their standardised measures. Our study supports their requests for further investigation into this matter.

**T Tests:**
The Paired-Sample T-Tests were administered to assess the groups’ scores individually from Time 1 to Time 2 and their findings support the results of the ANOVAs. The Treated group improved significantly more than the Control group as the former improved on all
language measures (see Table 4, Results section) and the latter improved significantly on three out of five measures (See Table 5, Results section) (Word Classes Receptive, Word Definitions and BPVS).

The Control groups’ improvement is not surprising as students learn vocabulary in many environments, e.g. school and home, and their vocabulary knowledge increases with intellectual maturation (Cirrin and Gillam 2008). Moreover, the first academic semester of secondary school is an intensive teaching period in which students are introduced to a vast array of new vocabulary (Starling et al 2012), hence it was suspected that the Control group would improve on some language measures.

The Control group did not show significant improvement on Word Classes Expressive and Word Associations subtests. These subtests require metalinguistic skills, e.g. the development of semantic categories and the knowledge of multiple meaning words. These skills were specifically targeted in the intervention, so it may be suggested that the Control group did not improve on these subtests as they were not taught these skills. This has clinical significance as it implies that these skills may need to be directly taught to students if they are not present entering secondary school to allow for deep lexical development.

**Pre-treatment scores and gains made:**

The results from the correlation tests illustrate a moderate negative relationship between pre-treatment scores and gains made on four of the five measures: Word Classes Receptive, Word Classes Expressive, Word Associations and BPVS. This negative correlation suggests that the lower the scores at Time 1, the greater the improvement made. This finding is extremely important as it implies that the students’ with the lowest vocabulary skills benefitted the most from the whole-class based intervention.

However, this correlation requires further investigation as current research reports that students with persistent disorders such as SLI, (many of whom have low vocabulary skills), require intensive individual intervention (Larson and McKinley 2003). As our study did not assess for SLI due to time constraints, we cannot refute these findings but the
correlation results would suggest that further research is warranted to determine the most suitable service delivery for this population.

**Research Design:**
Our research findings add new information about how the VEP can be delivered. While Joffe (2011) targeted small groups of students with SLI, we provided the intervention to whole classes of students from areas of social disadvantage, which were considered to be at risk of language difficulties. The positive findings of the whole-class approach have important practical benefits as mentioned in the introduction, such as targeting those with hidden SLCNs and reducing the amount of time absent from class. Our research shows that the VEP can be integrated into the academic timetable e.g. English class with the collaborative support of teachers and speech and language therapists.

The collaboration between teachers and speech and language therapists was also a success, adding to the already positive research (Nash 2009; Wilson et al 2010). All the teachers completed the programme and they were reported to seek support from the speech and language therapists throughout the intervention. The teachers also stated that they were appreciative of the new knowledge e.g. typical language acquisition, and strategies e.g. use of complex word maps that they had learned through the collaboration (Greene 2014; McBurney 2014).

Due to these positive findings, this research supports the use of strategy-based intervention rather than direct vocabulary instruction (Lesaux et al 2010). Teaching strategies develops the students’ metalinguistic competencies enabling them to learn independently (van Kleeck 1994, as cited in Nippold 2007). It also promotes generalisation of skills, the development of abstract thinking and the ability to process information critically (Larson and McKinley 2003). Moreover, as adolescents’ language is considered to be “individualistic” (Nippold 2007) and shaped by their interests, equipping them with tools to decipher vocabulary in their preferred topic is more practical than teaching them words from academic text.
As this is the first randomised control trial assessing whole-class vocabulary intervention for mainstream secondary school students in socially disadvantaged areas, we have addressed Lesaux and colleagues’ call for a more robust research design when focusing on this population (2010). Our findings can be regarded as valid and reliable (Level 1b Scottish Intercollegiate Guidelines Network). This has important theoretical and clinical significance and provides meaningful data to clinicians who work with schools in socially disadvantaged areas.

Limitations

While this study used a robust RCT design, it also had some design limitations. Blinding was attempted and testers were blinded to Time 1 scores at Time 2 but double blinding was not effective. Testers were not successfully blinded to which school received intervention and as a result this may have created a Rosenthal effect (Polgar and Thomas 2008). Moreover, the Treated group and the Control group were not blinded to who received the intervention, which may have formed a Hawthorne effect (Polgar and Thomas 2008).

Convenient sampling was used due to time constraints and access to schools from social disadvantage and as a result a gender imbalance was created (170 females: 75 males). This type of sampling is considered to threaten the credibility of findings (Polgar and Thomas 2008) as it may not be representative of the population and therefore cannot be supported as true for that general population.

Finally, as we chose to use standardised, norm-referenced assessments to evaluate change from Time 1 to Time 2, we were not able to determine specifically which vocabulary strategies were effective in causing this change.
Clinical Implications and Recommendations:

This study has important implications for clinicians and teachers working with adolescents from areas of social disadvantage. It suggests that by using a collaborative approach to a whole-class vocabulary programme, aspects of receptive and expressive vocabulary skills of adolescents from areas of social disadvantage can significantly improve.

The positive results of this research can be partially attributed to the whole-class approach to intervention and we would recommend a reduction in the pull-out model. As previously mentioned in the introduction, the whole-class approach enhances all students’ language skills, including those with hidden SLCN and this is vital in areas of social disadvantage where students’ are at greater risk of language difficulties. This model also offers speech and language therapists a more efficient service delivery option by providing effective therapy to more students in less time, which then allows more time for complex cases that may require individual sessions.

The collaborative model of intervention is well supported in the current literature (Paul and Norbury 2013; Wilson et al 2010) and this study supports these positive findings. Feedback from both teachers and speech and language therapists found that the collaborative approach was effective and efficient, and both reported that they would be happy to work in partnership again (Greene 2014; McBurney 2014). This type of interdisciplinary work is critical in developing and bolstering adolescents’ speech, language and vocabulary skills.

This research highlights that teaching indirect vocabulary strategies can significantly improve aspects of expressive and receptive vocabulary knowledge. This type of instruction empowers and enables students’ to learn new vocabulary independently. Equipped with these strategies, the students can decipher the meaning of unknown words by using recognising the prefix/suffix and identifying the root of the word. As a
result, this research would promote indirect vocabulary instruction (strategy learning) rather than direct instruction (teaching of lists of vocabulary).

Highlighted from the limitations of this research, it would be recommended in future research to identify students with specific diagnoses such as SLI prior to intervention. This would determine whether this type of whole-class vocabulary intervention is appropriate for such students or whether they would still require one-to-one therapy.

Another caveat of our study, which we would draw attention to for future studies, is assessment measures. While we advocate the use of standardised assessments, we would advise implementing additional measures, tailored to evaluate the effectiveness of the strategies in the intervention.

The current findings that a whole-class vocabulary intervention improves aspects of receptive and expressive vocabulary skills of adolescents from areas of social disadvantage is clinically significant as it enables speech and language therapists to fulfil the needs of adolescents, providing therapy in an effective and efficient manner.

This research is the first study to provide whole-class vocabulary intervention to adolescents’ from areas of social disadvantage using a collaborative approach in Ireland and the UK. It offers fundamental data to all professionals working and caring for adolescents’ educational and social needs. It provides an alternative effective service delivery, which is critical in our current economic climate where services are being reduced rather than supplemented.

**Conclusions**

Adolescents’ ability to define semantic connections, form semantic categories and develop a deep broad knowledge of vocabulary improved after twelve weeks of whole-class strategy-based vocabulary intervention in areas of social disadvantage. Adolescents with low language skills made the greatest gains. This research encourages speech and language therapists to work in an interdisciplinary model, training others with the skills to
aid language development. This provides educators and Speech and Language Therapists with an alternative service delivery providing therapy to whole classes of students in an effective and efficient manner. Most importantly, this research highlights that by arming students with the correct tools, they are enabled and empowered to learn and decipher meanings independently.

Further research is needed to determine the long-term effects of such an intervention programme, to investigate whether it is adequate for students with SLI and to pinpoint which aspects of the intervention are most successful.

These promising findings should urge educators, policy makers and speech and language therapists to investigate further and to adapt their intervention methods and service delivery to support and care for adolescents’ in this time of complex transition.
References


## Appendix A: Overview of the content in the Vocabulary Enrichment Programme.

<table>
<thead>
<tr>
<th>Session 1: Introduction: What are Words?</th>
<th>Students will understand that words are labels (made up of letters, sounds and meaning).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students will be able to identify where words are important and why (school, home, with friends, etc.).</td>
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<td>Students will identify at least one area of strength and weakness and will self-generate a target for themselves.</td>
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<td>Session 2: Describing Words (Senses, Characteristics and Antonyms/Synonym)</td>
<td>Students to understand that words have lots of connected meanings and name their 5 senses.</td>
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<td>Students to be able to use their 5 senses to describe an item.</td>
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<td>Students to understand and identify basic antonyms and synonyms.</td>
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<td>Session 3: Word Maps, Syllables, Rhyme and Categorisation.</td>
<td>Students to understand that there are lots of ways of describing a word and, the more information we know, the easier it is to remember the words.</td>
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<td>Students to be able to segment 2-3 words into syllables.</td>
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<td>Students to be able to say why words rhyme (sound same at the end) and identify words that rhyme.</td>
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<td>Students to understand that everything belongs in a category and to be able to identify the superordinate and subordinate categories of 2-3 items.</td>
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<td>Students to be able to identify syllables, sounds and letters in words.</td>
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<td>Session 4: Syllables, Alliteration and Parts of Speech - Nouns/Verbs.</td>
<td>Students to understand why we use the same sound at the beginning of words to describe things (alliteration).</td>
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<td>Students to understand what a noun is, that there are different types of nouns and to be able to give examples.</td>
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<td>Students to understand what a verb is, that verbs change depending on past, present and future and give examples.</td>
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| Session 5: Parts of Speech | Students to understand and be able to name 2-3 of each part of speech.  
Students to be able to create sentences using each part of speech. |
|---------------------------|------------------------------------------------------------------|
| Session 6: Identifying all Parts of Speech, Complex Word Maps and Word Families | Students to understand and be able to identify all parts of speech within sentences.  
Students to be able to describe words using many features (word map).  
Students will be able to integrate all features of a word to guess the word.  
Students to understand that words are connected through the root meaning and words exist in families (e.g. happy, happiness, unhappy). |
| Session 7: Prefix, Roots and Suffix’s; Dictionary Use. | Students to understand that looking at part of a word can help with understanding the word meaning.  
Students to work out word meanings when given the ‘prefix’ or ‘root’.  
Students to understand why we need dictionaries. |
| Session 8: Similarities and Differences and Multiple Meaning Words; Dictionary Use | Students can identify characteristics of words including what’s similar and what’s different. Students can think abstractly about the features of different items.  
Students can think of connecting words quickly.  
Students understand that some words sound/spelled the same but have different meanings.  
Students to know all alphabet letters in sequence. |
| Session 9: Spiderwebs and Idioms; Dictionary Use | Students to understand why we use spiderwebs and how to use them.  
Students to understand that idioms (groups of words/phrases) can have a meaning that is different to the meaning of the individual words.  
Students to be able to put idioms in sentences.  
Students to know what information we can find out about a word from the dictionary. |
| Session 10: | Students to understand that there are strategies to use if you do |
| Word Detective Strategies; Dictionary Use | not know a word. Students to be able to use the word detective strategies to guess a word. Students to be able to use a dictionary to check a word's meaning. Students to understand why we need and how we can use word maps in school. Students to understand why we need and how we can use antonyms/synonyms in school. Students to understand why we need and how we can use categories to help us in school. Students recognise when they can’t think of a word and to know 1-2 strategies for finding words. Students to recall what information you can get from a dictionary and identify for 3 words. |
| Session 11: Recap on Strategies: Word Map, Word Description. Introduce: Word Finding Strategies | Students can identify one area where they would use the word detective strategies in school. Students to attempt to identify at least 3-4 words from their prefix/root/suffix. Students to be able to self-identify multiple meaning words/phrases that they now know. Students to identify at least one thing they have learned and at least one thing they still find difficult. |