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Improving Vocabulary Knowledge in Primary Education: An Analysis of an Intervention Programme for Polish-Speaking Children Aged 7–9

Abstract

This paper discusses a vocabulary intervention programme for monolingual Polish children. Vocabulary instruction was conducted in a group of children aged 7–9 (N = 77) attending a primary school near Gdansk in Poland. Following a pre-test an intervention group (22 pupils receiving instruction over 10 weeks) and a control group (55 pupils) were selected. The taught vocabulary consisted of 20 Polish words. Additionally, another 20 words were carefully selected to form an untaught vocabulary list (control list). Although the intervention group did

not achieve a higher mean post-test result in taught words than the control group, the mean increase was larger in the intervention group, confirmed by a test for two means (p = 0.036). The difference was not confirmed for untaught words (p = 0.236). A linear regression model was used to explain which factors influenced post-test results. For taught words only pre-test results had an impact. For untaught words pre-test results and interaction of pre-test results with groups had an impact. The number of sessions attended also influenced post-test results. The paper includes the results of a survey where teachers and parents provided feedback.

Although the intervention programme increased children's vocabulary, it raised some important questions concerning the size of the gain, word selection and conditions of the instruction.

Keywords: vocabulary knowledge, vocabulary instruction, Polish speakers, Polish vocabulary, primary school.

Introduction

Vocabulary stimulation methods
It is commonly agreed that children commence their education with varied verbal skills. This disparity in vocabulary size results from a multitude of factors, including the home environment in which children acquired their first language (L1), i.e., their verbal interactions with parents, siblings and other relatives, as well as their degree of exposure to story reading, educational toys, television and other media. Arguably, two children with almost identical language skills and intelligence can begin school with considerably different vocabulary. Differences are noticeable already in children aged three or five (Hart & Risley, 1995, cited in: Christ & Wang, 2011, p. 426; Coyne et al., 2007, p. 74). They tend to increase as time goes by if not attended to (Biemiller & Slonim, 2001), leading to a problem known as "the vocabulary gap" (Biemiller, 2003; Coyne et al., 2007; Pullen et al., 2010; Christ & Wang, 2011), which affects e.g. reading skills (Cain & Oakhill, 2011).

Vocabulary stimulation should take into consideration not only the manner of testing but also the difficulty of selected lexical items. Words known and used in speech and words known in writing are labelled "oral vocabulary" and "print vocabulary" respectively (Hiebert & Kamil, 2005, p. 3). A more detailed classification comes from Dyson et al. (2018), who used a three-tier division. Their Tier 1 comprises the basic vocabulary used in casual speech

even by young children. Tier 2 consists of more sophisticated words with a wider range of possible meanings and syntactic contexts. Such words are often used in both speech and writing by adults as well as children. The last group, Tier 3, includes professional jargon and more specialised vocabulary used primarily in writing. Before preschool or kindergarten, most of children's vocabulary belongs to Tier 1, and individual differences in their vocabulary usually go unnoticed. However, the moment children enter preschool, any such differences begin having a direct impact on their learning in general.

Vocabulary stimulation methods can be divided into two major types. The first category of methods rely primarily on natural intuitive and spontaneous processes of language acquisition, i.e. "purposeful exposure" (Christ & Wang, 2011, p. 430) or "incidental exposure" (Coyne et al., 2007, p. 75; Pullen et al., 2010, p. 112), more generally labelled "implicit instruction" (Dyson et al., 2018, p. 948). The effectiveness of these methods has been analysed by Coyne et al. (2007, p. 75), Nicholson & White (1994), and Robbins & Ehri (1994, cited in Pullen et al., 2010, p. 113). The second category comprises methods based on more deliberate language instruction, i.e. "direct instruction" (Christ & Wang, 2011, p. 431). Their effectiveness has been assessed by e.g. Beck & McKeown (2007), Biemiller & Boote (2006), Coyne, McCoach, & Kapp (2007), Dickinson et al. (2019), and Hiebert & Kamil (2005). It has also been used to compare the effectiveness of vocabulary instruction in groups of native and second-language speakers of English (Carlo et al., 2004).

The "multiple method" of introducing new vocabulary combines the two types mentioned above: purposeful (implicit) exposure and explicit instruction. In such cases the teacher decides which type of instruction to adopt for a given word (Christ & Wang, 2011, p. 431). According to Apthorp (2006, p. 67), the method using both word definitions and substantial exposure to new words has been shown to be more successful than one type of instruction, either implicit or explicit. This is not surprising, given that engaging students' attention and cognitive skills in multiple ways increases the chances of finding a key to unlocking the effective way to teach each individual student in a group. The effectiveness of the multiple method has been confirmed by Stahl & Fairbanks (1986, in: Biemiller, 2003, p. 326).

Estimating vocabulary growth varies according to students' age, level of literacy attained and general language skills. Younger informants are assessed

orally rather than expected to read questions and write down answers. One example of a vocabulary test for younger children is the Peabody Picture Vocabulary Test (Dunn & Dunn, 2007), which is based on a child indicating the meaning of a word provided on a selection of four pictures. It has been used by Biemiller & Slonim (2001), Dickinson et al. (2003), Rice & Hoffman (2015), Biemiller & Boote (2006), Christ & Wang (2011), Coyne et al. (2007), Lee (2011) and Pullen et al. (2010). Polish authors Haman, Fronczyk & Miękisz (2010) describe another picture-based test for use with kindergarten children.

A method which is apparently more difficult for both students and researchers consists in asking a student for a definition of a word or its use in context. These methods of assessment may be oral or written, in the case of older children (Biemiller & Slonim, 2001).

The effectiveness of vocabulary stimulation depends on numerous variables. Christ & Wang (2011, pp. 433–434) note that the number and relative difficulty of the words taught are one important criterion (Hiebert & Kamil, 2005, pp. 10–11), while the actual manner of pre- and post-testing can change the results dramatically. Needless to say, the length of an intervention, the average time devoted to each child and a child's motivation are some of the significant factors which need to be taken into account when we attempt to compare and contrast the effectiveness of different interventions, including their long- and short-term effects (Nash & Snowling, 2006).

Questions and predictions of the present study

Although Polish specialists in linguistics, speech therapy and pedagogy have conducted much research into the use of Polish vocabulary at school (Polański, 1982) and later stages of kindergarten (Borowiec, 2003), the available literature contains no examples of vocabulary stimulation. The aforementioned research relies more on testing students and drawing conclusions about the state of the teaching of Polish at school than on exploring the vocabulary gap and finding means of closing it. In keeping with the Polish tradition of prescriptive linguistics, these studies often focus on standard usage or "correctness" in terms of grammar and spelling and errors that are common among students (Parnowska, 1983; Rocławska-Daniluk & Rataj, 2016). What

is more, vocabulary is often studied indirectly by reading students' essays, as vocabulary gains do not appear to be a popular topic (Seretny, 2018, p. 49). We may note that Seretny's works, while giving an insight into Polish vocabulary, usually concern Polish as a foreign language and are thus less relevant to the present study.

To analyse how children's vocabulary skills progressed as a result of the stimulation and how we could improve it, we asked two research questions, accompanied by brief answers below:

1. What improvement is made in the knowledge of the taught versus untaught words as shown by the students' scores in a multiple-choice vocabulary post-test?

Improvement was measured using two variables. Firstly, the difference in the post-test score and pre-test score in the intervention and control groups was compared for both untaught and taught words. Secondly, linear regression models were fitted to the data with post-test score being the dependent variable, while pre-test score, group (intervention or control) and number of sessions attended by children in the intervention group were used as independent variables.

2. What feedback do the parents and teachers provide on the vocabulary intervention programme?

The analysis was based on questionnaires asking for feedback from parents and teachers. It consisted mostly of yes/no questions, with an additional option of "I do not know", concerning children's attitudes towards the intervention classes as well as parents' and teachers' views on the stimulation programme.

Methodology

Study design, vocabulary material and participants
Before we began our programme we had found Polish equivalents for the words used in the vocabulary study designed for British children of the same age compiled by Dyson et al. (2018) and based on Beck et al. (2002). Two sets of English words (20 words each) used by Dyson et al. (2018) were translated and adapted to Polish. When searching for the best equivalents for English words, we decided to limit our choice only to words listed in

a student dictionary of Polish (Drabik & Sobol, 2007)[1]. In this way a list of 40 Polish words (20 taught and 20 untaught) was established (Table 1). The set used in the stimulation was labelled "taught words" and the unstimulated one was labelled "untaught words". Both sets (taught and untaught) were used in the pre- and post-stimulation tests. The entire programme (the pre- and post-test and the stimulation) was carried out by two of the present authors in small groups of max. 6 students who obtained their parents' permission to participate in sessions after the regular, curricular lessons were over.

Table 1. Two experimental word sets in Polish: taught and untaught (with English glosses)

Taught words	Untaught words
1. kruchy (brittle)	1. przyjemny (pleasant)
2. delikatny (gentle, subtle)	2. uczestniczyć (participate)
3. niespokojny (anxious, uneasy)	3. dyskomfort (discomfort)
4. gardzić (despise)	4. zniewaga (insult)
5. przewidywać (predict)	5. wreszcie (eventually)
6. niejasny (vague)	6. zmylić (mislead)
7. frustracja (frustration)	7. wyzdrowieć (recover)
8. ograniczona (limited)	8. oczywiście (obviously)
9. priorytet (priority)	9. fascynujące (fascinating)
10. całkowicie (completely)	10. jedność (integrity)
11. nienawiść (hatred)	11. wniosek (conclusion)
12. odejść (depart, move away)	12. dojrzały (mature)
13. bezsilny (helpless)	13. człowieczeństwo (humanity)
14. rozważać (contemplate)	14. przedstawiać (introduce)
15. przeciwstawić się (resist)	15. uczestniczyć (participate)
16. energiczny (vigorous)	16. niezawodny (reliable)
17. przetrwać (survive, outlast)	17. ohydne (hideous)
18. jasność (clarity, brightness)	18. hojny (generous)
19. natychmiast (immediately)	19. złośliwe (vicious)
20. wdzięczność (gratitude)	20. rozkwitać (flourish)

Source: Authors' study.

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[1] This dictionary for schools contains ca 36,000 entries for popular vocabulary selected from the Polish Language Corpus. The dictionary is addressed to primary and junior secondary school students.

For each of the taught words we designed a word-to-meaning matching test displayed on a screen (the Appendix 1 provides a sample of the slides we used in MS Power Point™). Additionally, for the taught set we compiled a manual of lexical exercises appropriate for Polish-speaking schoolchildren. During each stimulation session between 1 and 3 words were taught.

Additionally, before beginning the stimulation programme we obtained approval from the Ethics Committee at the University of Gdansk, Poland, as well as informed consent from the head teacher of the school to use the vocabulary programme as an intervention tool.

Participants

The students were recruited from 7 classes in one state-funded school. Pursuant to the European Union law on GDPR (General Data Protection Regulation), only students whose parents' permissions we obtained were allowed to take part in the programme. Eventually, 77 pupils aged 7–9 years in grades 1-3 (analogous to US grades 2–4, GB years 3–5) were involved in a group-administered vocabulary pre-test which was conducted on one school day. Implementing the programme during regular classes proved to be impossible because teachers are obliged to comply with Poland's national school curriculum. All the children were native speakers of Polish without special educational needs and were all learning English as a foreign language since English is taught to over 90% of students at all levels of education in Poland (European Commission/EACEA/Eurydice, 2017, p. 73). Each child's total score on the word sets was regressed on age. This means that for each child the pre-test result of 40 words was set against their age in order to reach a balanced age average in both groups. The participants whose scores were the lowest and unstandardized residuals reached below - 4 were included in the intervention group of 22 students (12 girls and 10 boys). That group underwent 10 weeks of stimulation, with two weekly classes (20–25 min per session) conducted by the same two experimenters who conducted the pre-test and had similar experience in teaching young children. The children received an average of 13 sessions (range = 2–24, SD = 2.59). The remaining group of 55 children constituted the control group. The mean ages for the intervention and control groups were: 8 years; 4 months and 8 years; 5 months respectively.

Procedures of the study

At the beginning a multiple-choice pre-test for all 40 words (20 taught and 20 untaught) was presented to the children in a MS Power Point™ presentation on a projection screen. The entire pre-test was conducted during one school day in 7 classrooms by the same two experimenters who conducted the stimulation in groups of 6 students in the following weeks. Each child had an answer sheet and a pen. The children were supposed to read each of the words tested and its four definitions from the MS Power Point™ presentation projected on the screen silently, but eventually all of them preferred to listen to the experimenters read them aloud to the entire group. The experimenters asked the children to mark the selected number of definition of the word on the answer sheet or leave the item blank. The children were not asked to write down or rewrite the selected definition. Instead, they only ticked or encircled the correct answer on the sheet. In the final score the lack of an answer counted as an incorrect answer. The same procedure was used for both the pre-test and the post-test administered 10 weeks later.

The process of vocabulary stimulation was organised in the following manner:

The researcher wrote down one item from the list of taught words (e.g. *wdzięczność* – "gratitude") on the board, read it aloud and students repeated it. The researcher asked students if they could make a sentence with the word or provide an easily understandable definition, e.g. "Gratitude is something that we feel when we want to say or do something nice for someone because he/she has done something nice for us." Their attention was drawn to the different context-dependent meanings of the word. To keep students interested, the researcher encouraged them to play games such as matching pictures and words, matching synonyms and antonyms to the word, making drawings that illustrate the meaning of the word in a given context or acting out the meaning of the word. Furthermore, the structure of a word, its inflection and spelling were analysed. The researcher reacted positively to all signs of creative activity, trying to manage discipline as well as maintain a friendly atmosphere. At the end of the class children received prize stickers. Sample material on the word *wdzięczność* "gratitude" is attached in Appendix 2.

Results

Statistical analysis

In order to answer the questions posed in 1.2 above, we conducted statistical analyses which we present in the graphs below. Figure 1 presents boxplots summarising the results achieved by children from the intervention and control groups at the pre-test and post-test in untaught words.
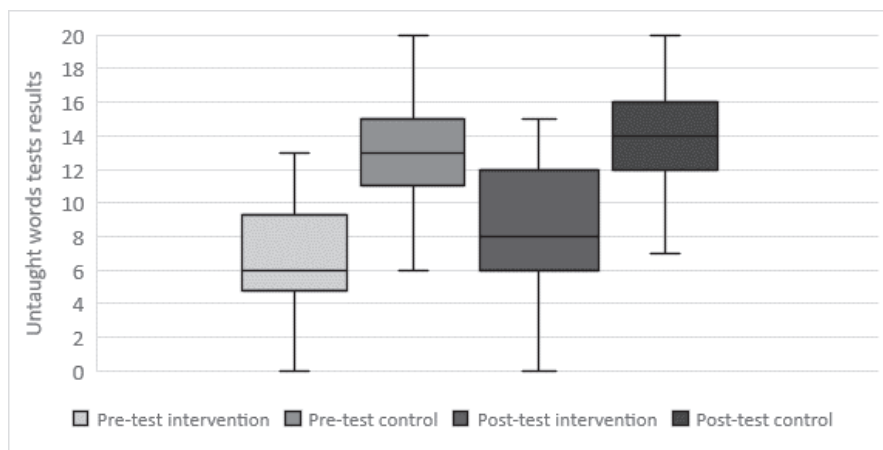

Figure 1. Boxplots for pre-test and post-test vocabulary scores by control and intervention groups for the untaught words. Tails = Min-Max, Box = Q1-Q3, Line = Median
Source: Authors' study.

The boxplots in Figure 1 present the minimum and maximum scores (indicated by tails), the first and third quartiles (indicated by the box) and the median (horizontal line). Children in the intervention group obtained lower scores than children in the control group, as indicated by the median and quartiles. Not much change between pre-test and post-test results could be observed in both groups. In addition, the post-test mean score in the intervention group was not higher than the post-test mean score in the control group regarding untaught words (see Table 2). This demonstrates that as far as untaught words are concerned, the results of the intervention group did not improve significantly following the intervention. However, it needs to be noted that regarding untaught words, the increase in the mean in the

intervention group (8.41 – 6.82 = 1.59) is somewhat larger when compared to the control group (14.09 – 13.27 = 0.82).

The comparison displayed in Figure 2 was made in order to answer our key question: did children from the intervention group achieve higher results in the post-test as regards taught words in comparison to the control group?
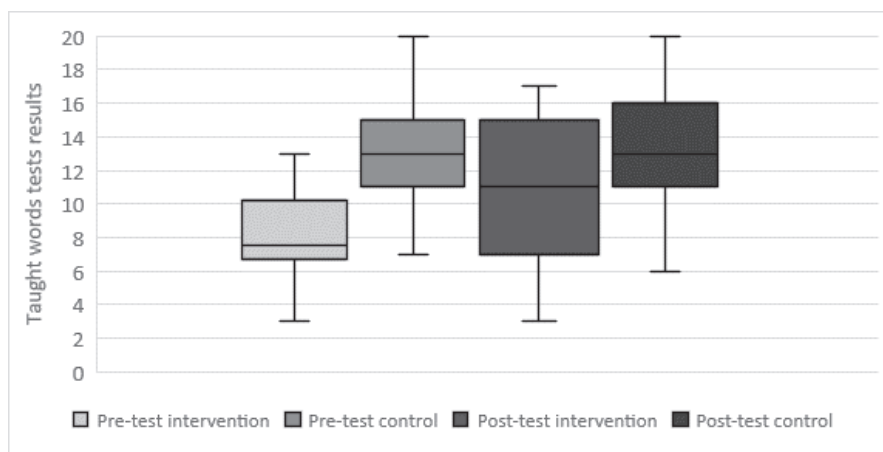

Figure 2. Boxplots for pre-test and post-test vocabulary scores by control and intervention groups for the taught words Tails = Min-Max, Box = Q1-Q3, Line = Median
Source: Authors' study.

As was the case for untaught words, there was not much change between pre-test and post-test scores for taught words in the control group. There was, however, a noticeable increase in the median score (from 7.5 to 11) in the intervention group. It was, however, still below the median score for the control group (13). At the same time, the dispersion of scores increased in this group, as indicated by the width of the box in the plot for post-test scores.

When the mean scores for both groups are compared (Table 2), it is evident that the control group mean score applying to taught words is higher than that of the intervention group in the pre- and post-test. Nevertheless, the results of the post-test in taught words show a noticeable increase in the mean score of the intervention group (i.e. 10.64 – 8.18 = 2.45) as opposed

to a smaller gain (13.63 – 12.96 = 0.67) in the control group, which fact is of significance in assessing the effectiveness of vocabulary stimulation.

Additionally, a null hypothesis stating that mean increases in score are equal in the two groups was tested against an alternative hypothesis that the mean increase in the intervention group was higher than in the control group. The null hypothesis was rejected (p = 0.036), which confirms that the programme was effective in teaching the target words to the children in the intervention group. The null hypothesis was not rejected in the case of untaught words (p = 0.236).

Our analyses provide evidence that the training effect for taught words was more considerable than for untaught words. However, the analyses give us no grounds for ruling out with absolute certainty the influence of the intervention programme on the results of the intervention group in the category of untaught words.

Table 2. Mean, standard deviations (SD) and maximum scores for intervention and control groups in pre-and post-test

	Intervention group (N = 22)				Control group (N = 55)			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Taught words (max.20)	8.18	2.84	10.64	4.27	12.96	2.48	13.64	3.17
Untaught words (max.20)	6.82	3.23	8.41	3.64	13.27	3.17	14.09	3.29

Source: Authors' study.

In order to analyse further the effect of the intervention on post-test score in taught and untaught words a linear regression model was then applied to the data. Two independent variables – pre-test score and group (coded 0 for the control and 1 for the intervention group) – as well as their interaction were included in the first form of the model. Effects which were shown to be insignificant for the investigated group of children were excluded in turn until the final form of the model was obtained. For the taught words the group effect, as well as interaction between group and pre-test score were insignificant, with only the pre-test effect being significant (Table 3).

Table 3. Results of regression for the taught words post-test score

Effect	Parameter	Standard error	p-value
Constant	5.165	1.264	0.0001
Pre-test	0.657	0.105	0.0000

Source: Authors' study.

Thus, the final model was:

$$\text{post-test} = 5.165 + 0.657 * \text{pre-test}$$
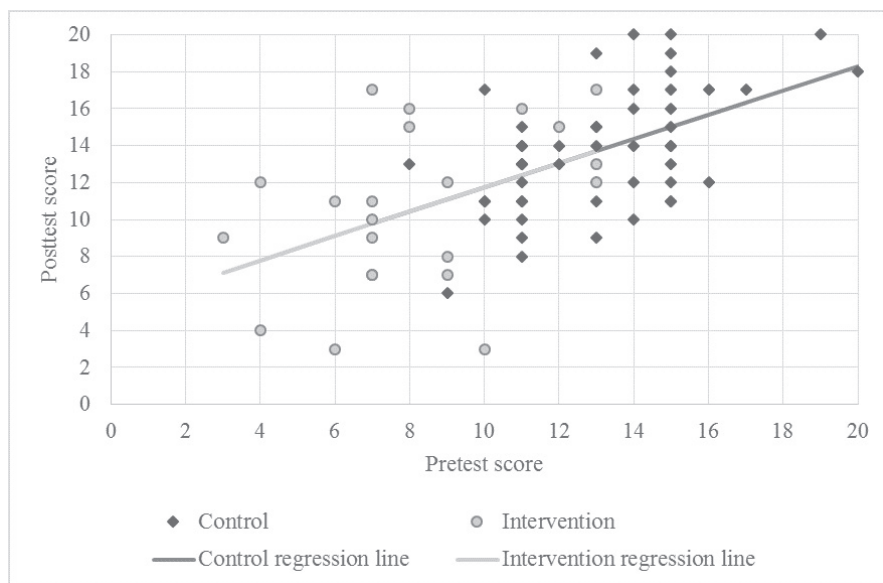
The fitted model is shown in Figure 3.

Figure 3. Post-test score plotted against pre-test score by control and intervention groups for the taught control words

Source: Authors' study.

As shown in Figure 3, the only independent variable which influenced the post-test score in both groups was the pre-test score, hence the regression lines for both control and intervention groups overlap. R^2 for the final model was equal to 33.5%, thus most of the variability in taught word post-test scores was not explained by the variables included in the model.

In the case of untaught words, the group effect proved to be insignificant; however, the interaction between group and pre-test score was significant and included in the model (Table 4).

Table 4. Results of regression for the untaught words post-test score

Effect	Parameter	Standard error	p-value
Constant	6.489	1.116	0.0000
Pre-test	0.578	0.085	0.0000
Pre-test * Group	-0.321	0.104	0.0028

Source: Authors' study.

The final form of the model was:

$$\text{post-test} = 6.489 + 0.578 * \text{pre-test} - 0.321 * \text{pre-test} * \text{group}$$

R^2 for the final model was 52.5%. The fitted model is shown in Figure 4.
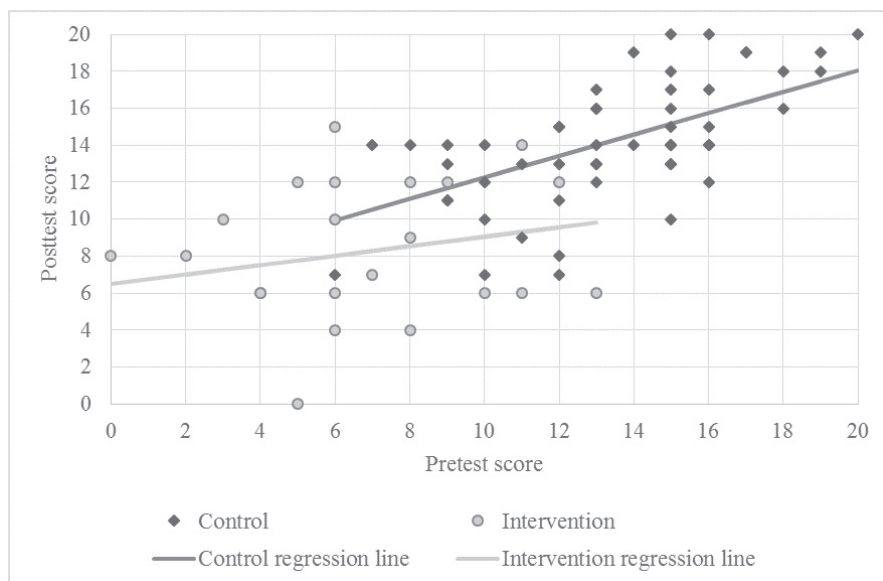

Figure 4. Post-test score plotted against pre-test score by control and intervention groups for the untaught words

Source: Authors' study.

As shown in Figure 4, the fitted regression line for the intervention group was less steep than for the control group. Children in the intervention group with higher scores on the pre-test obtained lower results on the post-test than children with similar pre-test scores from the control group. Such an effect was not present in the case of taught words.

In summary, our results show an improvement in scores of children in the intervention group in the case of taught words, as proven by a mean increase in score which was significantly higher than in the control group. Nevertheless, the mean post-test score in the intervention group was still below that of the control group. Results of the linear regression model also do not show much impact of the intervention on post-test scores. Several reasons can be identified to explain this. One of them is the fact that children in the intervention group participated in different numbers of sessions, with some taking part in as few as two sessions. A linear regression model was fitted to explain post-test results in taught words for the intervention group, using pre-test score and number of sessions attended as the independent variables. Pre-test results proved to be insignificant, and only the number of sessions was left in the final form of the model (Table 5).

Table 5. Results of regression for the taught words post-test score in the intervention group

Effect	Parameter	Standard error	p-value
Constant	4.819	2.187	0.0395
Number of sessions	0.454	0.159	0.0097

Source: Authors' study.

The final form of the model was:

$$\text{post-test} = 4.819 + 0.454 * \text{number of sessions}$$

R^2 for the final model was 25.5%. The fitted model is shown in Figure 5.

Results show that the number of sessions did have some impact on the post-test results. Variability in the number of sessions attended by the children (mean number of sessions attended was 12.8, with a standard deviation of 5.1) could lead to greater variability in post-test scores and make the impact of the intervention harder to identify.
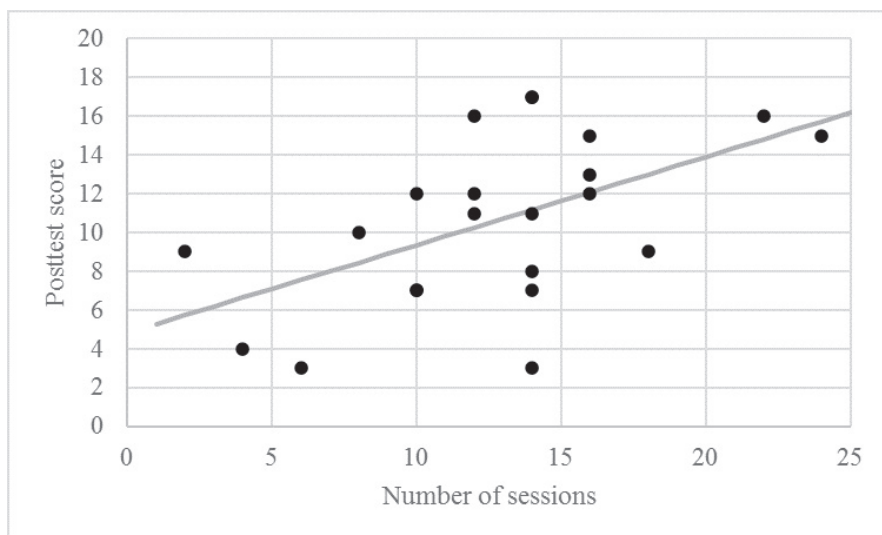
Figure 5. Post-test score plotted against number of sessions of the intervention groups for the taught words

Source: Authors' study.

Questionnaire analysis

After the post-test two questionnaires were distributed to the teachers and parents of students. Five out of seven teachers (one for each class) filled in teacher questionnaires and returned them.

In response to the question: "Were children satisfied with the vocabulary stimulation sessions?", three teachers indicated that the sessions had been interesting and children liked them. Two respondents answered: "I do not know".

In response to the question: "Should more vocabulary activities be introduced to the school curriculum?", four teachers agreed, since in their opinion children had numerous problems with vocabulary and the majority of primary grade students needed more lexical stimulation. One teacher answered: "I do not know".

In response to the question: "Have you noticed any children talking about words in stimulation during regular classes?", four teachers reported that they had not noticed any children talking about it. One respondent answered: "I do not know".

As far as parents are concerned, thirteen respondents out of twenty-two (one for each stimulated child) returned parent questionnaires after the post-test. This questionnaire required parents to provide information or feedback on vocabulary stimulation. In response to the question: "Was your child satisfied with the vocabulary stimulation sessions?", ten of the parents answered that children liked the sessions. Two were dissatisfied and one answered: "I do not know".

In response to the question: "Has your child talked about the vocabulary they had learned during the intervention sessions?", six parents agreed, indicating that children mentioned vocabulary which they had learned. One respondent answered: "I do not know", and the remaining six answered that their children did not talk about vocabulary they had learned.

In response to the next question, concerning children's willingness to learn new words ("Has your child been asking about new words more often after stimulation?"), eight respondents noticed that children had been asking about new words at home more often than before. Three parents replied that their children had not been asking about new vocabulary more often. The remaining two parents answered: "I do not know". Twelve respondents indicated that this kind of stimulation was good for children and it should be continued. Only one parent answered: "I do not know".

Discussion

The questions that arise here are whether using a different list of words would have led to greater progress, how to assess improvement in vocabulary skills as significant and whether it would be possible to establish norms regarding the increase in children's vocabulary size. An intervention programme addressed to a group of students with lower pre-test scores could be analysed independently of the control group. Monitoring the progress of the group with smaller vocabulary could be compared to other groups whose initial vocabulary size is comparable and who are taught similar content.

The increase in means demonstrates that children in the intervention group have learning potential which can be observed also when untaught material is tested (Christ & Wang, 2011). It is important to note that some previous studies showed that in children at this educational stage simple

exposure alone (without instruction) may result in 12% word-learning gain (Biemiller & Boote, 2006). When this percentage figure is compared to our study of 20 words, it turns out that the number is very similar (2.4 words) to the increase in vocabulary size in our intervention group (2.45 words).

Dispersion of results is inevitable in the conditions of an extracurricular school intervention limited by the school timetable and calendar. We could pose the question whether students' absence had the largest impact on the dispersion. In order to draw conclusions, one should make sure that there is a sufficiently large group of students with a similar number of intervention classes attended.

Further research is required to investigate the possibility of generalising the results of the intervention group. This would be possible in our study if progress in the taught and untaught words had yielded similar results or, better still, if the generalisation of a word to its use in other contexts could be measured. It is worth asking what conditions should have been met in order for the generalisation of results to be possible, e.g. whether positive feedback from the parents and teachers collected in our questionnaires could be regarded as generalising the students' results.

Our findings may be somewhat limited by the manner in which the post-test was conducted. Pursuant to the procedure, the testing of the 20 taught words took place prior to the testing of the 20 untaught words. Since the test was 45 minutes long, during its second part (testing untaught words) the students from the intervention group might have already been tired. Perhaps the factor of a child's attention span compared to the duration of the test played a significant part in researching this group of children. This may be an important issue for future research.

Regarding the number of words learnt by children in proportion to the depth of their understanding, one needs to note that during the intervention programme the depth of the meaning of words in different contexts needs to suit the child's age. We found the conducting of vocabulary stimulation in a group of children of different ages to be challenging; hence, in future research it would be better to conduct similar studies in groups where the age stratification is more homogeneous.

The programme was relatively short (10 weeks) and carried out entirely by two researchers. Planning the classes so that each child would be stimula-

ted identically and post-tested by a person previously unknown to him/her turned out to be impossible. Therefore, we decided to focus on the methods of stimulation and the feedback we gained from parents and teachers. The results of our stimulation show what can be accomplished with a group of weakest-performing but typically developing students when they are provided with additional classes which are organised like extracurricular activities at school.

An important observation to be made is that when particular words are not taught, the lexical skills in the group of students remain at the same level. Quantitative results in this type of intervention studies are therefore not remarkable. Hence qualitative results of the intervention group should also be taken into account in future studies.

The increase in the knowledge of untaught words in the intervention group can be explained in a number of ways: natural development of the children over a period of 10 weeks, higher motivation and courage to do tasks already known to them, as well as other so far unknown factors resulting from the children having become accustomed to the research material. Furthermore, in the control group, where no vocabulary stimulation took place, some improvement in the knowledge of the 20 taught words can be observed after 10 weeks, as was also observed by Christ & Wang (2011).

Finally, the teachers' feedback brought additional insights to the school environment where the research was conducted. Some teachers did not pay attention to our stimulation; some others did not return our questionnaires. Undoubtedly, the most important information that we gained from the questionnaires was provided by parents. The majority of them reported that subsequent to the intervention most of the children had begun to ask about the meanings of unfamiliar words more frequently than before.

Conclusions

Our study has demonstrated that 10 weeks of a small-group vocabulary intervention programme caused an increase in vocabulary knowledge. As regards the mean scores, the intervention brought gains in the knowledge of directly taught words and a little increase in untaught words (although insignificant from the statistical point of view).

Generally, children with good vocabulary skills in the pre-test also scored better in the post-test as far as taught words are concerned. Quantitative analysis has shown that in the case of children with similar scores on the pre-test in untaught words, those from the intervention group scored lower in the post-test than those assigned to the control group. We may assume that the manner of testing children (testing always began with the taught words) could influence the results. Further work is required to investigate this intriguing result. Different ways of measuring the depth of acquired vocabulary should be investigated in future studies. This would include measuring students' linguistic awareness through tasks that require them to become conscious of word polysemy.

In our view the feedback obtained from parents and teachers has provided sufficient encouragement to evaluate the present results in future studies.

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Appendix 1.
A sample of vocabulary item (with translation displayed below)
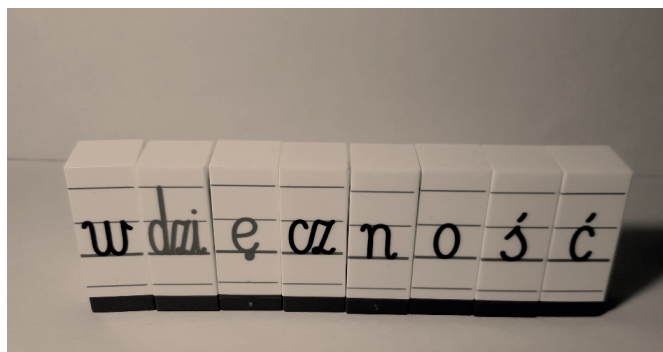

WDZIĘCZNOŚĆ
CZUJEMY GDY:

1) ktoś coś dobrego dla nas zrobił

2) ktoś użył brzydkich słów

3) ktoś zabiera nam to, co lubimy

4) ktoś się do nas wdzięczy

WE FEEL GRATITUDE WHEN:

1) someone did something good for us;

2) someone has taken away something we like from us;

3) someone is charming.

Appendix 2.
LOGO blocks used during stimulation

1. Would you feel grateful (Polish "wdzięczny") in these situations? Say the word *gratitude* (Polish "wdzięczność") out loud if these situations would make you feel that way.
   a) I wanted to go to a birthday party, but I wasn't invited.
   b) I bought ice cream in the school shop, and I forgot to pay for it.
   c) I fell in the street, and then a lady came and helped me get up.
   d) I ate all my sweets and didn't share them with my brother.
   e) I brought a puppy home, but my mum didn't let me keep it.
   f) When I was ill, my friend helped me catch up on the things they were doing at school.
2. Who can be grateful to whom? Say the word *gratitude* out loud if you think someone there can be grateful.
   g) A patient to a doctor
   h) A daughter to her mother
   i) A victim to a criminal
   j) A nurse to a patient
   k) A student to a teacher
   l) A convict to a judge
   m) A husband to a wife