Wizards of Words

Evaluation of the Effectiveness of Barnardos' Wizards of Words Reading Programme

EXECUTIVE SUMMARY

OÉ Gaillimh
NUI Galway

Barnardos

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"It's my beach hut," said Gran.

FOREWORD

I am very happy to welcome this executive summary for the evaluation of Barnardos' reading programme Wizards of Words (WoW). The positive findings from this independent evaluation confirm our conviction that a Barnardos programme, the design of which was informed by evidence, and delivered in partnership with committed schools and volunteers, could make a real and lasting difference to children's reading skills.

The journey of the design, development, implementation and evaluation of WoW started in 2005 with a site visit by Barnardos staff to the Experience Corps programme in the USA. Inspired by this inter-generational reading intervention, and with the knowledge that a significant number of children attending Barnardos services had poor reading skills, we decided to develop an out-of-class, inter-generational reading programme for children aged between six and eight years of age. The programme was first piloted in 2007 with a small number of schools in Dublin. Between 2007 and 2012 Barnardos partnered with 10 schools in Dublin and Limerick and more than 100 trained volunteers over the age of 55 to deliver the programme to more than 300 children. The evaluation, conducted by the Child and Family Research Centre at NUIG on behalf of Barnardos, was undertaken between 2008 and 2012.

The process of programme design and development involved extensive research on a range of issues including how children's reading skills develop, the factors which influence reading achievement and the policy context in which reading and literacy skills are developed. Enormous effort was required, from a range of people, to operationalise the programme, including the design and development of programme materials, recruitment of project staff and volunteers, the identification of schools and the assessment and recruitment of children for whom the programme would be suitable. It is heartening to see that the attention paid to these issues has been affirmed by positive reports from the school principals and teachers, and the volunteers who participated in WoW. The tight focus of the programme, the structured nature of the sessions, the regular assessment and review of children's progress, the training of and support for the volunteers, the commitment to achieving outcomes and the professionalism of the Barnardos staff were all identified as important features of the programme's success from the school staff and volunteer perspectives.

The programme pairs first and second class students, aged between six and eight years, nominated by their teacher for extra reading support, with an appropriately trained older volunteer. The purpose of the programme is to improve children's reading, their enjoyment of reading and their self-belief in their reading competence. We are delighted therefore, that the evaluation shows that WoW does indeed improve children's phonemic awareness and phonic knowledge; improve their word recognition skills; improve their enjoyment of reading; and improve the children's perceived competence in their reading ability.

Early on in the design and development of the programme, Barnardos made a commitment to the inter-generational element of the programme. We had seen for ourselves, with our visit to Experience Corps in the USA, the warmth, commitment and experience that the older volunteers brought to the programme; and we wanted to replicate this with WoW. The findings from this evaluation confirm our commitment to this feature of the programme. The evaluation shows that the one-to-one reading sessions with highly trained volunteers helped to build a very strong bond and relationship with the participating children and that the inter-generational dimension is key to the programme's success.

The publication of this executive summary is the culmination of many years hard work for a variety of people involved in the development, implementation and evaluation of the WoW programme. I would like to express my thanks to all those how have contributed to the success of the programme:

- The Atlantic Philanthropies whose financial support made the development, implementation and evaluation of the programme possible
- Barnardos staff who contributed to the successful design, development, implementation and evaluation of the programme including, in alphabetical order: Sharon Brady, Niamh Conaty, Jim Corbett, Siobhan Greene, Sinead Hardiman, Claire Hickey, Monica Hynds, Suzie Lewis, Maura McMahon, Jennifer Murphy, Debbie Oxley, Kerri Smith and Angela Walsh
- School staff from all the schools involved in the implementation and evaluation of the programme; their commitment to improving outcomes for children, willingness to partner with us in delivering the programme, and their welcome to and accommodation of the WoW volunteers and WoW staff have all contributed to the success of the programme
- WoW volunteers who were so committed to the programme and the children with whom they read; without their contribution the successful implementation of the programme would not have been possible
- Members of Barnardos Best Practice Advisory Committee who provided invaluable support and advice during the evaluation process and in particular Mark Dynarksi and Professor Jacqueline Barnes
- The evaluation team, led by Dr John Canavan, Dr Allyn Fives, Dr Carmel Devaney and Dr Noreen Kearns at the Child and Family Research Centre at NUI Galway who conducted the research on our behalf and were our partners in the evaluation process

The evaluation shows that a volunteer-based reading programme can ensure positive outcomes for children's reading ability and their reading confidence. The evaluation also shows that volunteer programmes, such as WoW, that lead to gains in reading for young children, are highly efficient given that they minimise costs for participating schools.

Suzanne Connolly
Director of Children's Services
Barnardos

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"I call it Sandy Feet," she said.

Introduction

Wizards of Words (WoW) is a volunteer reading program run by Barnardos in primary schools in mainly disadvantaged areas in Dublin and Limerick. Volunteers over the age of 55 are recruited and trained by Barnardos Project Leaders. Participants are children in 1st and 2nd class experiencing delays in reading but who do not need formal reading interventions such as participation in Reading Recovery and are not in receipt of additional resource teaching hours.

The evaluation of WoW was carried out by the Child and Family Research Centre (CFRC) at NUI Galway between 2008 and 2012. The study design combined:

- Outcomes study: a randomized controlled trial (RCT) evaluation of programme impact
- Process study: an evaluation of programme implementation

In this explanatory mixed methods approach, data from the process study were utilised to expand on and provide plausible reasons for the outcomes study findings.

In the RCT, one half of all participating children were randomly allocated to a control group and the other half to an intervention group. The control group then received regular classroom teaching only and the intervention group received regular classroom teaching plus WoW. To evaluate the effectiveness of the WoW programme outcomes were measured at pre-programme (Time 0), post-programme (Time 1), and follow-up (Time 2).

Educational Disadvantage and Reading Programmes

Recent studies have shown that gaps in reading achievement between advantaged and economically disadvantaged children exist prior to children starting school and, among the disadvantaged groups, literacy achievement declines as children progress through primary school (Kennedy, 2009; Eivers et al., 2005). In Ireland, the Delivering Equality of Opportunity in Schools (DEIS) initiative was designed to ensure that the most disadvantaged schools benefited from a comprehensive package of supports to tackle literacy problems (DES, 2005). The NESF report on Child Literacy and Social Inclusion (2005) recommended 'targeted literacy interventions,' 'structured literacy programmes,' 'strong links with the community,' and raising the expectations of teachers and families for children in relation to literacy. In 2011, the first national strategy in Ireland for literacy and numeracy was launched, Literacy and Numeracy for Learning and Life 2011-2020, which aims to foster a culture of enjoyment of reading and more positive attitudes to mathematics amongst children and young people as well as enabling schools to build effective working relationships with parents and communities to support learning (DES, 2011).

Current research suggests volunteer reading programmes may be a cost-effective source of positive outcomes for children considered 'at risk' of reading failure (Vellutino et al., 1998; Rimm-Kaufman, et al., 1999; Meier and Invernizzi, 2001; Pullen et al., 2004: Allor and McCathren, 2004; Morrow-Howell, et al., 2009b; Lee et al., 2011). A meta-analysis of RCT studies in the USA also reported higher effect sizes for programmes with trained tutors than for programmes with untrained volunteers (Elbaum et al., 2000, in Pullen et al., 2004: 24). A further meta-analysis found significant improvements for many reading sub-skills, including decoding, knowledge of words, and reading accuracy, but not comprehension (Ritter et al., 2009: 19; Wasik, 1998; Baker et al., 2000).

The evaluation of Experience Corps, which inspired the initial design of WoW, reported small gains for reading comprehension and teachers' assessments of reading skills, and gains on phonemic awareness approaching statistical significance. Gains were greater for those who received the recommended dosage, and there was a significant association between reading gains and the quality or nature of the volunteer-child relationship (Morrow-Howell et al., 2009b: 6).

A review of reading programmes in the UK found that a 'partnership' scheme was effective if it provided poorer readers with substantially increased time for reading, supported by a sympathetic, more skilled reader who received structured training and ongoing support (Brooks, 2002). In Northern Ireland, Time to Read improved outcomes for children in the core foundational skills of decoding, reading rate, and reading fluency (Miller et al., 2011). In the Republic of Ireland, Doodle Den, an after-school reading programme implemented by the Tallaght West Childhood Development Initiative, made improvements in children's word recognition ($d = 0.17$), sentence structure ($d = 0.30$), and word choice ($d = 0.26$) (Biggart et al., 2012). Other reading support programmes currently being implemented and/or evaluated include Ready to Learn (in Northern Ireland), and youngballymun (in the Republic of Ireland).

The WoW Programme

Barnardos developed the WoW programme as a response to reading difficulties experienced by young children in disadvantaged areas, and the risk of early school leaving. WoW reflects the two high-level outcomes for children identified in the Barnardos Family Support Strategy: increased capacity for learning and development; and improved emotional well-being (Barnardos, 2008a).

WoW is a school-based inter-generational programme, pairing an eligible child with one or more trained volunteers aged 55 years and over for one-to-one reading sessions. The WoW programme outcomes are as follows:

1. To make improvements in the children's reading comprehension, reading fluency, vocabulary building, and phonemic awareness
2. To encourage and promote their interest in and love of reading
3. To improve their perceived competence and enjoyment of reading

WoW utilizes the 'Balanced Literacy Approach,' which combines elements from a Whole Language approach (comprehension, including vocabulary, grammar, and verbal reasoning) and a Phonics approach (decoding, including phonics and phonological awareness). Reading sessions were scheduled three times a week, lasted for approximately 30 minutes, and divided into pre-reading, reading, and follow-up activities.

The criteria for inclusion in WoW are:

• Children's reading level should be between the following thresholds:

- For 1st class children, the lower threshold is 18 months behind the age-appropriate reading level and the upper threshold is 4 months behind
- For 2nd class children the lower threshold is 24 months behind and the upper threshold is 4 months behind (as measured on WIAT Single Word Reading)

• Children must not need specialist support, that is, they:

- Do not have diagnosed general or specific learning disabilities, or behavioural difficulties
- Are not in the Reading Recovery programme or receiving supplementary teaching in English with a Learning Support teacher
- Children must not have planned/foreseeable extended absences from school

Programme materials used in WoW were taken from the Oxford Reading Tree, including Floppy Phonics. Two project leaders, one in each city, managed and coordinated WoW. The project leaders have a professional background in education, as it is important to understand literacy development and educational support in children, to understand teacher training and the school setting, and to impart this knowledge to volunteers.

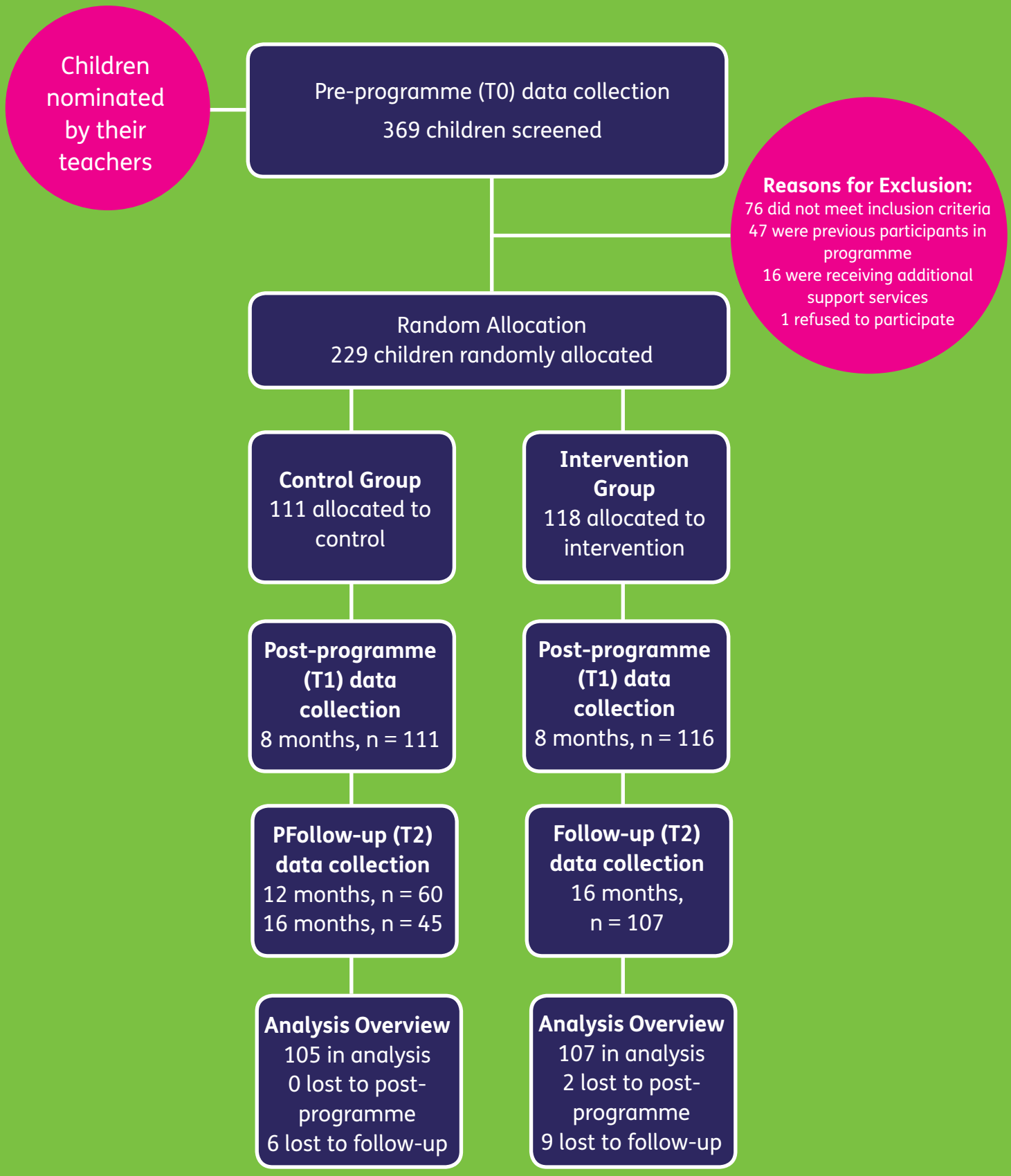
Methodology

The study design combined a randomized controlled trial (RCT) outcomes study over two years with a process study evaluation of programme implementation over three years. The two were combined in an explanatory mixed methods approach, as process study data were used to expand on and to find plausible reasons for findings from the outcomes study.

The research questions for this study were:

1. Was receipt of the WoW programme effective in creating improvements in children's reading ability and reading self-beliefs?
2. Did some variables modify the impact of the programme e.g. reading ability, gender, and class year?
3. Did some variables predict participants' response to the intervention e.g. programme dosage, school attendance, relationship with volunteer?
4. What was the relationship between programme implementation and outcomes for children?

Figure 1: Participant Flow in the RCT Outcomes Study.



The RCT study was a pre-test/post-test control group design (Shadish et al., 2002). There was a pre-programme measure (Time 0), followed by the random allocation of children to control and intervention groups. Children were measured again, at the end of the school year (Time 1; 8 months later), and once again during the next academic year (Time 2; 12 or 16 months later). Participant flow is represented in Figure 1 as per the CONSORT statement guidelines (Altman et al., 2001).

Children were recruited to the study in the following way. Teachers nominated children who they thought would benefit from the programme. Written informed consent was sought from all parents of nominated children and then from the child his or her self. All children who had consented to take part were then screened to ensure the programme was suitable for them. Random allocation was 'stratified' based on the participants' cohort (cohort 1 were children who received WoW during the 2009-2010 academic year and cohort 2 children in receipt of WoW during 2010-2011); school (one of eight in each cohort); and class year (1st class or 2nd class within each of the 8 schools in each cohort).

Outcomes study data were collected using

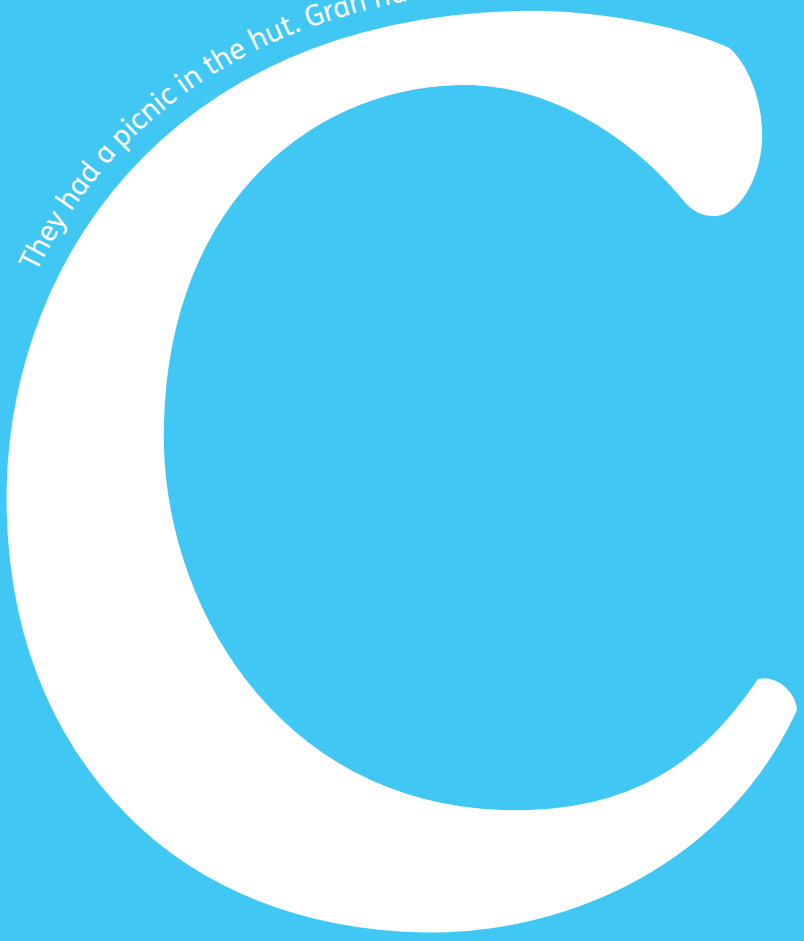
- WIAT (1) Single Word Reading and WIAT Spelling: a standardised assessment for word recognition and spelling
- British Picture Vocabulary Scale: a standardised assessment for vocabulary
- York Reading Passage: a standardised assessment for reading comprehension and reading accuracy
- Phonemic Awareness and Phonic Knowledge: criterion referenced assessments
- Enjoyment of reading and perceived confidence measure: a child self-report measure
- Teachers' Survey and Volunteers' Survey, both criterion referenced assessments of children's reading ability and reading self-beliefs

Data also were collected on dosage, receipt of additional support services, gender, and age.

The process study was formative and summative. Process study data were collected through interviews with children, parents, school staff, Barnardos staff, focus groups with volunteers, a review of reading records, surveys of volunteers, and observations of reading sessions (see Appendix 1 for a complete summary of data collection).

(1)
Wechsler Individual Achievement Test

They had a picnic in the hut. Gran had six seats.



Summary of Process Study Findings

This section presents the findings from the process study on the WoW programme. The findings are based on qualitative and quantitative data collected from the study participants. The chapter is structured around the four research questions of the process study:

1. What was the extent and nature of programme take up (i.e., programme utilisation)?
2. How well was the programme organised and run (i.e., programme organisation)?
3. What was the extent to which the programme was implemented in line with the model as specified in the WoW manual (i.e., programme fidelity)?
4. How was the programme experienced by children, school staff, and volunteers?

Programme Utilisation

The WoW programme appealed to school staff first because it offered literacy support. Seven out of the nine schools were designated as disadvantaged, and as part of the DEIS programme these schools focused their efforts on improving children's literacy. A further reason for its appeal was that the programme targeted children in the 'middle' range experiencing delays in reading but who were not eligible for formal reading interventions. According to one school principal:

> "The major benefit is the support for those children that I would say are in the middle category: not weak enough to get learning support, but not good enough to feel that they're succeeding at reading. So they're the children who would be at risk of failing reading, not becoming real readers, and not enjoying reading for the pleasures that it can afford. Nobody ever looks at these children! They're kind of the invisible children always."

Moreover, the programme was provided by an external agency with a reputation for providing high quality services, resulting in a relatively small additional workload for the school staff. As one school principal observed:

> "All the work is done by Barnardos. The class teacher doesn't have to do any extra work. So in selling it to the teachers this means it's not an additional burden. It isn't another programme we have to teach and squeeze into our curriculum and teachers love it because of that."

According to school staff, the balanced literacy approach fitted well with regular classroom teaching as it complemented current teaching styles and methods. In addition, the results of the broad range of assessments completed with each child were made available to school staff and could be used in developing lesson plans for each child.

The programme also appealed strongly to volunteers. The majority of volunteers were retired, had some spare time, and were motivated to use it productively. There was a strong sense of altruism evident amongst the volunteer group.

> "You're working all your life and rearing children, the whole lot and then you reach a stage where all that is behind you and you would just like to do something for someone else."

Programme Organisation

The programme was well organised, and a number of factors contributed this. School principals believed that the approach, attitude and expertise of the project leaders were exemplary. The contribution of the project leaders included their

- Preparatory work
- Technical knowledge about literacy development
- Clarity regarding the programme requirements
- Understanding of the school system
- Support of volunteers
- Ongoing monitoring of delivery

The good working relationship between project leaders and school staff allowed them to identify and address any potential difficulties at an early stage. In particular, specific attention was paid to: accommodating the reading sessions in the school premises; the timetabling of the sessions; and the withdrawal of the children from the classroom.

The volunteers' commitment to the programme, their enthusiasm, their interest in reading, their maturity, and their love of working with children all contributed to successful programme organisation. A school principal described how the schools experienced the WoW volunteers:

> I have to say that we've been just delighted with the programme, just the way it's organised, the motivation of the volunteers, the skill level of the volunteers and their ability to form relationships with the children and I guess form relationships with us as a school. So we see them very much as part of the extended team of the school.

Volunteers received an initial three days of training and two subsequent days. Training of volunteers was changed for the second cohort of children, with greater emphasis placed on phonics and a refinement of training in this area.

The majority of volunteers who started with WoW have continued with the programme. As a result the group of volunteers have built a strong working relationship with the project leader, and are very familiar with the WoW programme and with the schools in which it is delivered. An informal system of experienced volunteers assuming increased responsibility in the organisation of WoW has also developed over time.

Programme Fidelity

Observations of the reading sessions show that the programme was implemented with fidelity. In the reading sessions, volunteers were keen to adhere to the WoW manual and to have a productive session; and their interaction with the children was positive, supportive, and encouraging.

The volunteers were required to record the detail of each reading session using a specific template with sections on:

- The details of the child and volunteer and the date of the session
- The level and amount of reading material covered including the reading type used
- The progress across the four literacy areas as used in the guided reading approach
- The follow-up activities and what went well/was a challenge in the session
- The plan of work for the next reading session

The records show that the content of the sessions reflected the programme design. However, children in the programme received fewer reading sessions than planned. It was intended that children receive three sessions per week but the average weekly number of sessions was 1.8. This was explained by a number of factors: some schools could not accommodate three sessions per week; school closures and events/outings limited the number of sessions received; and some volunteers could not commit to providing three sessions per week.

Participants' Experience of WoW

All the participants in the study had a positive experience of the WoW programme. The children interviewed enjoyed the WoW sessions, felt their reading had improved, and had positive relationships with their volunteers. The children particularly liked reading, phonics, and playing word games. The children also did not wish to change any particular aspect of the session and were happy that it continued in its current format.

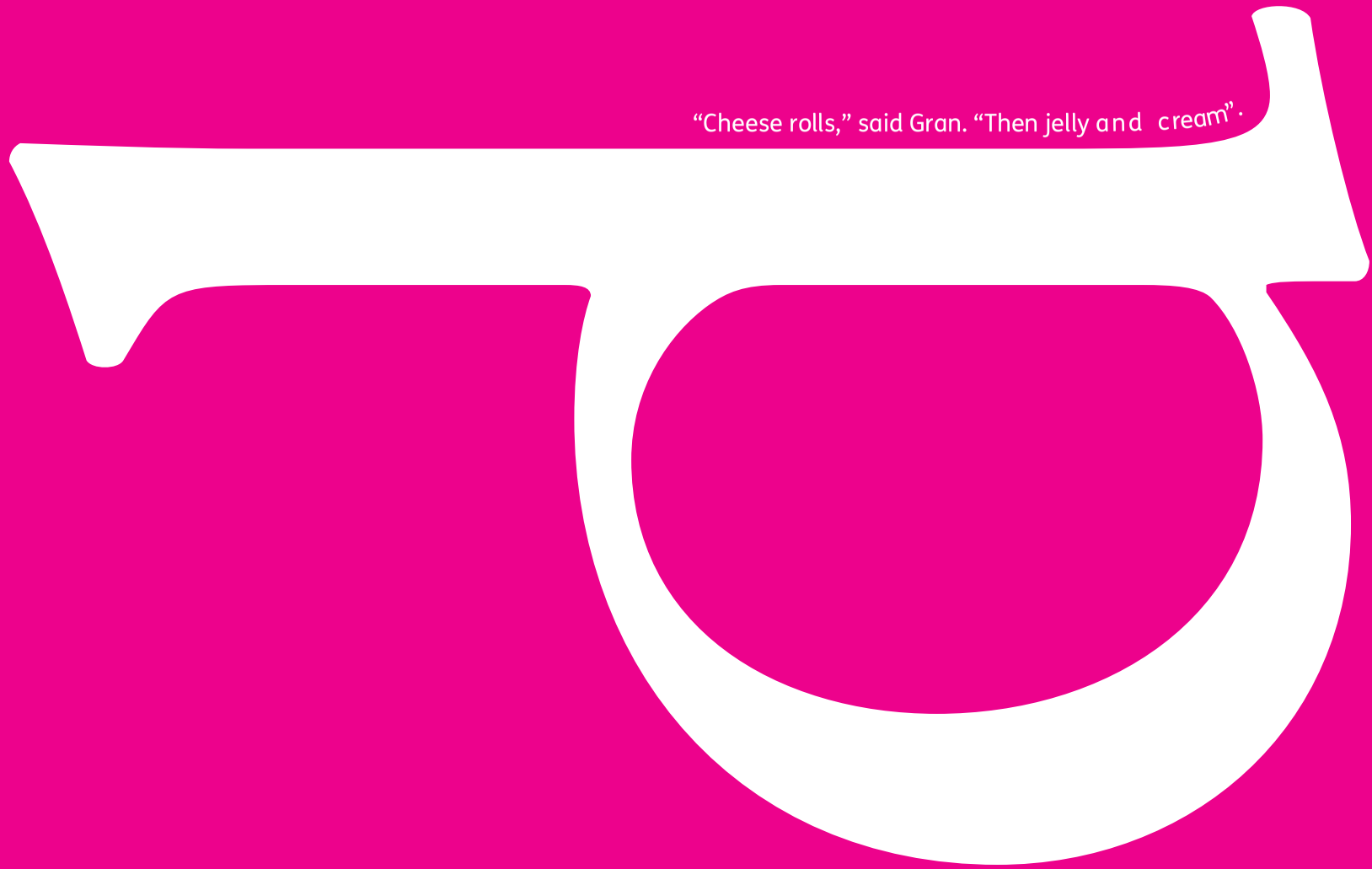
School staff observed children's emotional and social gains and improved reading ability, although without access to the findings from the RCT evaluation, and in a context of increased focus on literacy in the participating schools generally, they were not able to ascribe gains to WoW at the time of the interviews. All emphasised the whole school focus on literacy and the wide range of individual, small group, or classroom-based supports that the children who attended WoW were receiving.

> "You can actually see the changes happening in front of you, even the way they want to read the book, they want to choose the book, they even want to do the writing, they want to play the game. You see they actually want to do it whereas before they wouldn't want to do it at all because they were afraid of it"

Volunteers also observed improvements in children's reading ability and self-esteem. They highlighted how generally the children were quite shy and reserved when they started reading with them and did not have confidence to attempt words they did not know or offer an opinion on the stories. However, as the sessions progressed the children became more talkative, had direct eye contact, offered opinions, told stories, were willing to attempt words they did not know, put expression in their voice when reading, and were readily willing to read aloud.

Volunteers said that they themselves benefitted, as they valued the sense of purpose they received from this worthwhile activity as well as the social benefits. One volunteer described what being involved in the programme means to her:

> "You could feel quite useless after you have retired and it's so important getting children to improve and read. And I'd hate to give up my job and not do something. It certainly is good for our self esteem to be doing something. To dress up and go out two mornings a week is good for you"


“Cheese rolls,” said Gran. “Then jelly and cream”.

Summary of RCT Findings

The findings from the RCT outcomes study show where the programme was successful, what variables modified the impact of the programme, and what variables predicted programme success. In addition, findings from the process evaluation were analysed to show the ways in which successful programme implementation contributed to positive outcomes for children.

At Time 0, the intervention group began with lower mean scores on six of the eight measures: WIAT SWR, York Reading Accuracy, York Reading Comprehension, BPVS, WIAT Spelling, and Phonemic Awareness. By Time 2, the mean score of the intervention group was higher than the mean score of the control group on six measures: WIAT SWR, York Reading Accuracy, WIAT Spelling, Phonemic Awareness, Phonic Knowledge, and Enjoyment of Reading and Perceived Competence.

An analysis of covariance (ANCOVA) was used to calculate the impact of the programme as an effect size. The differences between the treatment and control groups at Time 1 and Time 2 were analysed while taking account of the effects of additional variables such as the children's assessment scores at pre-programme (Time 0), the children's gender, the school they attended, the city in which they lived, their class year, and cohort, that is whether or not they or not they participated in WoW during 2009-2010 or 2010-2011.

Programme impacts were analysed using two further methods. The gains made by each group were calculated, between Time 0 and Time 1 and between Time 0 and Time 2. These 'gain scores' were then analysed using an independent-samples t-test to determine if either of the two groups gained significantly more than the other. In addition, a multivariate analysis of covariance (MANCOVA) was used to explore the programme impact across both Time 1 and Time 2. The analysis also controlled for Time 0 scores.

The effect sizes at each time point are presented in Figures 2a and 2b. All positive values (above the horizontal line) represent programme impacts.

Figure 2a: Effect sizes at Time 1

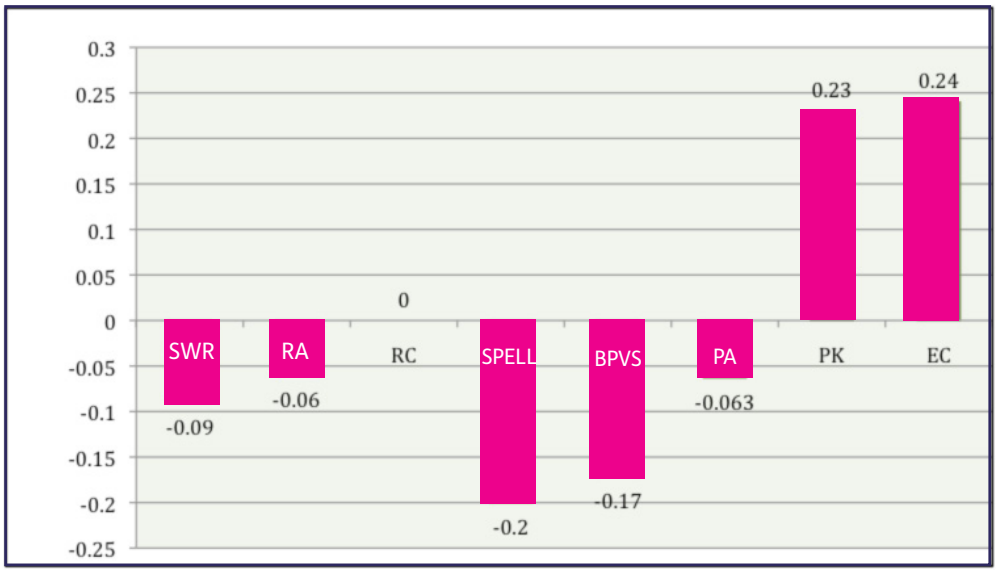
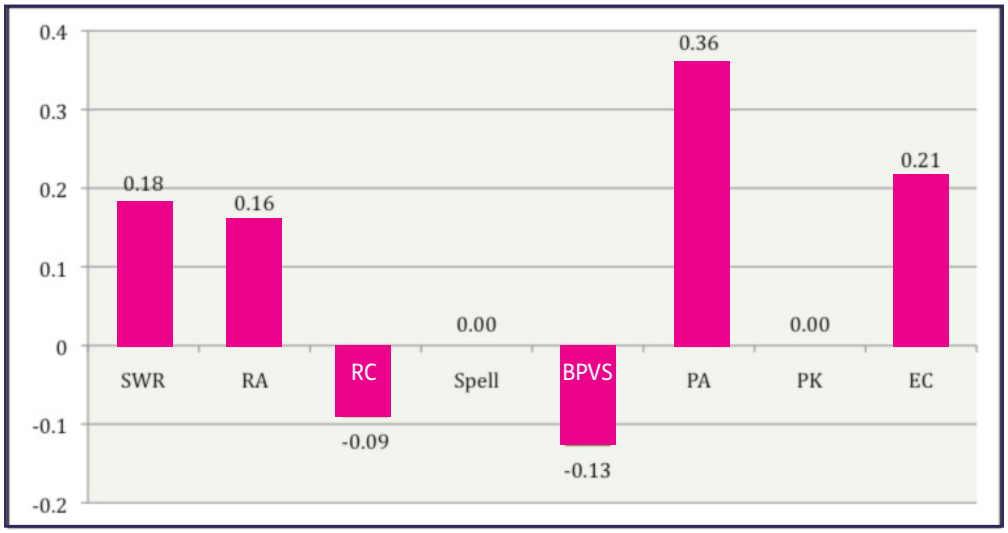


Figure 2b: Effect Sizes at Time 2



Effect sizes were calculated using ANCOVA. Measures are coded as follows: WIAT Single Word Reading (SWR), York Reading Accuracy (RA), York Reading Comprehension (RC), WIAT Spelling (Spell), British Picture Vocabulary Scale (BPVS), Phonemic Awareness (PA), Phonic Knowledge (PK), Enjoyment Competence (EC).

A summary of the analysis of programme impacts is provided in Table 1. For each of the outcomes measured, the mean scores at Time 1 and Time 2 (adjusted for covariates) of both the control group and the intervention group are given. This is followed by results from analysis of programme impact at Time 1 and at Time 2 separately (ANCOVA), and then an analysis of programme impacts at Time 1 and Time 2 together (MANCOVA).

Table 1: Summary of Analysis of Impact of the WoW Programme

Outcome	Time	Adjusted Means Control	Adjusted Means Intervention	ANCOVA results (Mean difference) Effect Size Cohen's d	MANCOVA results Effect Size Cohen's d
WIAT SWR	Time 1	86.35	85.66	(-0.64) -0.09	0.38**
	Time 2	85.91	87.54	1.44) 0.18	
YORK RA	Time 1	93.81	93.49	(-0.31) -0.06	0.20
	Time 2	92.16	93.17	(1.02) 0.16	
YORK RC	Time 1	100.76	100.61	(-0.05) 0.00	0.11
	Time 2	101.91	101.40	(-0.52) -0.09	
WIAT SPELL	Time 1	88.02	86.75	-1.27) -0.20	0.17
	Time 2	84.98	85.09	(0.11) 0.00	
BPVS	Time 1	94.81	93.73	(-1.09) -0.17	-0.14
	Time 2	94.79	93.89	(-0.91) -0.13	
Phonemic Awareness	Time 1	36.32	35.89	(-0.43) -0.06	0.37**
	Time 2	37.45	39.34	(1.89) 0.36**	
Phonic Knowledge	Time 1	30.87	31.70	(0.63) 0.23*	0.26
	Time 2	31.63	31.60	(-0.03) 0.00	
Enjoyment / Competence	Time 1	16.76	17.26	(0.61) 0.24*	0.33
	Time 2	17.01	17.48	(.34) 0.21	

Covariates in MANCOVA are Time 0 scores

Covariates in ANCOVA are Time 0 scores, school, cohort, class year, gender, city

* Significant at the $p < .10$ level. ** Significant at the $p < .05$ level. *** Significant at the $p < .001$ level.

Word recognition

The programme had a statistically significant impact on children's word recognition (WIAT SWR), when data from Time 1 and Time 2 are combined ($p = .02$, $d = 0.38$).

- The greatest gains were made by children with 'below average' reading levels (i.e. children reading at below the 16th percentile on WIAT SWR at Time 0), and intervention children made significantly greater gains in moving out of the 'below average' group than children in the control group
- Boys gained more from the programme than girls
- Boys with 'below average' reading levels gained by the most, but they also received a significantly higher dosage than girls with 'below average' scores
- Children in 1st class gained by more than children in 2nd class

School attendance did not predict scores on WIAT SWR in the intervention group, although it did in the control group, indicating the success of the programme even where school attendance was not good. The children's experience of WoW, as perceived by the volunteers, predicted children's scores on WIAT SWR and therefore the success of the programme on this outcome.

The target group for the programme were children experiencing delays in reading but who were not eligible for formal reading interventions, and such targeting was one reason why school personnel were receptive to the programme initially. However, the programme benefitted some of those who experienced a more significant delay in reading (i.e. it benefited those reading at 'below average' levels more than those at 'average' levels). In addition, although against study protocol, some children in the intervention group and the control group received further support services for reading. The data suggest that WoW was even more beneficial when children were also in receipt of other supports.

Phonemic awareness

The programme also had a significant impact on scores for phonemic awareness ($p = .03$, $d = 0.37$) and an impact approaching statistical significance on scores for phonic knowledge ($p = .09$, $d = 0.23$). The programme led to the greatest gains among 1st class children and among the second cohort of children. Neither school attendance nor programme dosage predicted scores on phonemic awareness, indicating that it was programme participation and not the number of sessions (dosage level) that led to success; and that the programme was successful even when school attendance was poor.

The success of the programme in this area was explained in part by the changes made for the second cohort of children to volunteer training, comprising a greater focus on phonics, and to programme delivery, which included the dedication of one session per week to phonics. The change in programme design and delivery also required greater competence and confidence on the part of volunteers in the delivery of more complex material and in turn greater support from project leaders.

Children's reading self-beliefs

The programme also had an impact on children's enjoyment of and perceived competence in reading and schoolwork (d = 0.24, p = .10). Children were more likely to enjoy reading and to feel competent about their reading and schoolwork if they received the WoW programme, and the difference was approaching statistical significance. Children who received WoW also enjoyed improvements in self-esteem (as perceived by volunteers), were more likely to read aloud and read independently (as perceived by volunteers) and to help other children with reading in class (as perceived by classroom teachers). The findings also show that the more children enjoyed gains in self-belief the more they also experienced gains in reading ability.

Data on programme implementation suggest plausible reasons for the observed gains in reading self-beliefs. First, children in the WoW programme were given the opportunity to read aloud and to do so in one-to-one sessions where volunteers gave positive reinforcement and praise for the children's reading efforts and the programme content was carefully matched to the child's need. Second, volunteers were aware of and were receiving positive feedback concerning their contribution to both the children's experiences of the sessions and the children's improved reading ability.

Reading accuracy

Intervention group children made greater gains than control group children, on scores for reading accuracy, although the differences were not statistically significant (p = .14, mean difference = 3.69, d = .21). Children in WoW with good school attendance also performed significantly better than children in WoW with poor school attendance. This suggests the programme may have been more successful in the area of reading accuracy with better school attendance. When volunteers were asked to rate the change in their child's reading ability, this also predicted scores on York Reading Accuracy (ß = .23, p = .06). This suggests that volunteers were aware of the impact that the programme was having on their children and that this awareness was a predictor of the success of the programme.

Reading comprehension and vocabulary

Although the differences were not statistically significant, children in the intervention group performed less well than children in the control group on scores for vocabulary (p = .36, d = -0.13) and reading comprehension (p = .56, d = -0.09). The data show that school attendance, WoW dosage (the number of sessions attended), the child's experience of the programme, and receipt of additional supports all predicted scores for reading comprehension. This indicates that the programme may have been more successful on this outcome with higher programme dosage. In addition, children who received additional support services plus WoW performed better on vocabulary than those who received WoW only and also better than those in the control group who received additional supports only.

Despite efforts to organise delivery of the programme to ensure the intervention group did not miss core subjects, the control group may also have benefited from classroom activities in the areas of comprehension and vocabulary including reading by the class teacher and library time, while intervention children were withdrawn to receive WoW.

Gains made between Time 1 and Time 2

More light can be shed on the impact of the programme by analysing gains made between Time 1 and Time 2. Although not an analysis of programme impact per se, as it does not use Time 0 as its starting point, this analysis helps illustrate when programme impacts occurred. Between Time 1 and Time 2, the intervention group made a statistically significant greater gain on WIAT SWR ($p = .01$, mean difference = 2.46, $d = 0.39$) and phonemic awareness ($p = .03$, mean difference = 1.94, $d = 0.30$). Between Time 1 and Time 2, the intervention group also made greater gains than the control group, although the difference was not statistically significant, on York Reading Accuracy ($p = .11$, mean difference = 1.41, $d = 0.21$).

In order to offer 1st class children in the control group the opportunity to attend WoW, if required, in 2nd class, Time 2 data were collected from the 1st class control group after 12 months and from the remainder of participants after 16 months. For that reason, there was a concern that the results would under-estimate the performance of the 1st class control group. However, further analysis shows that while class year modified the impact of the programme for the first cohort and among girls, it did not do so in the second cohort or among boys. As the timing of data collection was the same for both cohorts and for boys and girls, for that reason, the research team concluded that timing did not account for the observed impact of the programme (see Appendix 2).

A summary of findings from the evaluation of WoW are presented in Table 2. The table includes findings from all four research questions on programme impacts.

Table 1: Summary of Analysis of Impact of the WoW Programme

Outcome	Was the programme effective?	What variables modified programme impact?	What variables predicted response to programme?	What was the relation between programme implementation and outcomes?
Word recognition (SWR) Reading accuracy (RA)	Significant impact on WIAT SWR (p = .02, d = 0.38) Gains on RA (d = 0.21) not statistically significant (p = .14)	'Below average' gain most (SWR) 'Below average' boys gain most (SWR) Boys gain most (SWR) 1st class gain most (SWR)	'Experience' of WoW predicted SWR & RA Attendance predicted SWR in control only Greatest gains on RA for high dosage Volunteers' view of change in reading ability predicted RA	Extra session per week (dedicated to phonics) Boys: higher dosage Below average boys: higher dosage Programme emphasis on enjoyable experience more than one-to-one relationship Higher dosage in 1st class
Phonemic awareness (PA) Phonic knowledge (PK)	Significant impact on PA (p = .03, d = 0.37) Difference approaching statistical significance on PK (p = .09, d = 0.23)	Older children gain more in control only Cohort 1 gain by more in control only Boys gain more (PK)	Neither attendance nor dosage predicted scores on PA Enjoyment of reading in class correlated with PK	Additional training of volunteers & one session per week dedicated to phonics
Reading comprehension (RC)	No impact observed on York RC (p = .56, d = -0.09)		Attendance, dosage, experience of programme, additional supports all predicted RC Enjoyment of reading correlated with RC	Control group children participated in teacher-led activities such as reading by teacher and library time while WoW children were withdrawn Variation in dosage Low average dosage
Vocabulary (BPVS)	No impact observed on BPVS (p = .36, d = -0.13)		WoW children gained by more with additional supports	Classroom activities while WoW children withdrawn: reading by teacher, library time
Spelling	No impact observed	Boys gain more		
›Reading self-beliefs: Children, Teachers, Volunteers	Enjoyment Competence (p = .10, d = 0.24) 'Willing to read aloud and independently' 'Helps other pupils with reading' 'Self esteem'			Reading aloud One-to-one sessions Verbal encouragement and praise Intervention matched to need


“What a picnic,” said Biff. “It’s a feast”.

Discussion

What were the Impacts of WoW?

The children who received WoW made gains in some outcomes (word recognition, phonemic awareness, phonic knowledge, and reading self-beliefs) but not others (comprehension, vocabulary, and spelling). Gains were made in reading self-beliefs even though the WoW programme did not include self-esteem counselling. Gains were also made in reading accuracy (although the difference was not statistically significant), and children with good school attendance gained significantly more on this measure than children with poor school attendance.

One important question is whether effects produced by an intervention are 'maintained after it ceases' (Hatcher et al., 2006). Children who received WoW first made gains in phonic knowledge and reading self-beliefs (Time 1) and then in word recognition and phonemic awareness (Time 2). Gains were made in the basic skills needed for the further development of reading ability, in line with the Simple View of Reading (Stuart et al., 2008). Also, children who received WoW would perhaps have performed better on reading comprehension had they received a higher dosage, and therefore success in this area may be a matter of programme implementation rather than programme design.

Who Gained the Most?

The data show the importance of the correct targeting of the programme. Those who gained most from WoW were children reading at a 'below average' level but not in need of formal supports, as found with other volunteer reading programmes (Elbaum et al., 2000). Boys gained more than girls, and boys reading at a 'below average' level gained most from the one-to-one reading programme, as was the case in evaluations of other programmes (Rimm-Kaufman et al., 1999). Younger children gained more from WoW, suggesting the efficacy of earlier intervention for children at risk of reading failure (Pullen et al., 2004). Children in the second cohort also gained by more than children in the first cohort, which may be explained by a greater emphasis on phonics both in volunteer training and in programme content.

What Worked Well?

The programme was successful in bringing about gains in phonemic awareness and word recognition, even for those with poor school attendance and low programme dosage. In addition, programme success was predicted by whether the children had a positive experience of the programme (as reported by volunteers) rather than whether the children had good one-to-one relationships with volunteers (as reported by volunteers). This contrasts with findings from the evaluation of Experience Corps (Morrow-Howell, 2009b) and may be explained by the fact that children who received WoW were 'paired' with more than one volunteer. The WoW sessions led to greater enjoyment of reading, and other studies have identified a reciprocal causal relation between self-beliefs and reading achievement (Marsh and O'Mara, 2008). The WoW programme may have led to gains in comprehension if children had received a higher programme dosage and if they had received other support services.

What was the Relationship between Programme Implementation and Children's Outcomes?

WoW was designed so as to complement reading instruction in the classroom and research on volunteering programmes suggests that such complementary approaches benefit students at-risk of reading difficulties (Ehri et al., 2007; Vadasy et al., 2008; Gattis et al., 2010). The targeted nature of the programme was also a key appeal to school personnel, although the programme did not benefit all those targeted. The programme was implemented successfully in part because it did not disrupt the school timetable, but in some cases WoW children did miss out on some reading-related activities.

The centrality of the project leader role to the success of WoW supports Wasik's conclusions that successful reading programmes require a designated coordinator who knows about reading and reading instruction; the presence of structure in the tutoring sessions; and the provision of ongoing training to the tutors (1998). A key motivator for volunteers was the quality and meaning of their participation. WoW volunteers could tell when their children's reading had improved and their perception of their child's experience was a key predictor of the child's success in the programme.

The consistency of programme implementation can be inferred from the outcomes data: there were no significant differences in the impact of the programme in the different schools. Changes to volunteer training and programme delivery were made, but they led to more positive outcomes for children and vindicated the confidence in volunteers to deliver more complex material. Finally, what was important in terms of outcomes was the child's positive experience of the one-to-one sessions with a small number of different volunteers.

Implications for Practice and Policy

What are the implications of these findings for practice and policy? This study contributes to evidence-based practice and policy in the area of volunteer reading programmes. The randomized controlled trial design allows inferences to be drawn concerning causation. The process study provides evidence on programme implementation and how implementation contributes to programme impacts.

The findings are generalizable to other programmes with a similar target population in similar socio-economic environments. This is relevant especially for decisions regarding the future roll-out of WoW. The programme was provided free of charge to the schools, and the use of volunteers' minimized costs to Barnardos, nonetheless funding was required to ensure effective implementation and will be required for any future roll-out.

Practice implications

The findings from this study have a number of important practice implications across a range of themes including:

- Programme organisation
- Programme content
- Programme dosage
- Target group

Each is addressed in turn, below.

Programme organisation:

- Positive outcomes for children can be achieved through the implementation of WoW when:
  - Volunteers are highly trained and receive continuous support
  - There is a strong working relationship between programme providers and schoolpersonnel
  - Ongoing training and support measures are provided to prevent variation in programme delivery and to ensure fidelity to the model
- A positive programme experience for children, based on one-to-one reading sessions with supportive older volunteer readers, and an intervention matched to the children's needs, benefits children's reading ability as well as their reading self-beliefs

Programme content:

- To achieve improvements in children's reading ability practitioners should prioritise phonemic awareness and phonic knowledge, as these are the building blocks for further reading
- Volunteer training in this technical area of reading education, support from project leaders, and prioritisation of phonics in delivery are all necessary for success.
-

Programme dosage:

- Higher dosage should lead to better reading outcomes in the areas of reading comprehension and reading accuracy
- Participation in the programme leads to positive outcomes for children in phonemic awareness and word recognition regardless of the number of sessions that the child attends and when school attendance is poor

Target group:

- The programme should be targeted at children starting at 'below average' reading levels (< 16th percentile on WIAT SWR)
- The programme should not be targeted at girls starting with 'average' reading levels
- The programme should give priority to targeting younger readers (1st class) although gains can also be made by 2nd class children

Policy implications

Given that there has been a major strategic focus on tackling the issue of declining literacy in Ireland, and in particular its persistence in disadvantaged areas, the findings from this study also have important implications for policy.

- Tackling educational disadvantage through targeted interventions, using structured programmes, and with strong links to the community can achieve positive outcomes for children
- A volunteer-based reading programme can ensure positive outcomes for children's reading ability and their reading self-beliefs
- Volunteer programmes that lead to moderate gains are highly efficient given that they minimise costs, although substantial organisational resources are needed for the successful implementation of the programme
- NGOs can play an important role in helping to ensure positive outcomes for children experiencing delays in reading. As this study has shown, positive collaboration is possible between an NGO and schools, although this requires considerable experience, expertise, and financial commitment
- WoW is an out-of-class programme that worked, and therefore it shows the benefits that can be achieved by combining out-of-class programmes with classroom teaching
- It is important that programmes are targeted at the correct group, and furthermore ensure an optimum match between the children's needs and the intervention


Gran had a boat at the jetty. “I call it the jolly Jean,” she said.

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Glossary of Terms

Analysis of variance (ANOVA)

An analysis of variance (ANOVA) is used when comparing the mean scores of two or more groups. There is a continuous dependent variable and the independent variable can have a number of levels. The test compares the variance (variability in scores) between the different groups (believed to be due to the independent variable) with the variability within each group (believed to be due to chance). It calculates an F ratio: a large F ratio indicates there is more variability between the groups (caused by the independent variable) than there is within each group (caused by chance).

Analysis of covariance (ANCOVA)

An analysis of covariance (ANCOVA) allows the differences at Time 1 or Time 2 between the two groups (control and intervention) to be analysed while controlling for the effects of an additional variable or 'covariate' (e.g. scores at Time 0).

CONSORT statement

CONSORT stands for Consolidated Standards of Reporting Trials. The CONSORT statement is an evidence-based, minimum set of recommendations for reporting RCTs. It offers a standard way for authors to prepare reports of trial findings, facilitating their complete and transparent reporting, and aiding their critical appraisal and interpretation.

Effect Size

The effect size in this study represents the impact of the WoW programme on those in receipt of the programme when compared with the progress made by children in the control group. It is necessary to represent the effect size in standardised form. The 'standardised mean difference' describes the size of the effect in standard deviations, and indicates how large the effect is 'relative to the range of scores found between the lowest and the highest ones in the study' (Rossi et al., 2004, p. 304). An effect size of .5 entails the mean score for the intervention group is half a standard deviation greater than the mean score for the control group.

Formative evaluation

Formative evaluation is a method of judging the worth of a program while the program activities are forming or happening. It focuses on process.

Multivariate analysis of variance (MANOVA)

While ANOVA tests whether mean differences on a single dependent variable are likely to have occurred by chance, a multivariate analysis of variance (MANOVA) is used when there is more than one dependent variable. MANOVA is also an alternative to repeated-measures ANOVA, as it views data collected at different time points on a measure simply as separate dependent variables.

Multiple regression

Multiple regression analysis explores the relationship between one continuous dependent variable and a number of independent variables or predictors. The results indicate how much of the variance in the dependent variable is due to the predictor variable (the R square value), the standard deviation change in the dependent variable caused by any unit change in the independent variable and the direction of the change (the standardised beta value), and whether the results are statistically significant (the p value).

Simple effects analysis

A simple effects analysis looks at the effect of one independent variable at individual levels of the other independent variable. It is a comparison of condition means to determine if differences between means for one level of an independent variable are the same as differences at the other level(s) of the independent variable. For example, are differences in mean scores for girls between the control group and the intervention group at Time 2 on WIAT SWR the same as for boys?

T-test

An independent-samples t-test makes possible a comparison of the mean scores of two different groups, for example study condition (control or intervention), on a continuous variable. The test produces estimates of effect sizes.

Statistical significance

The significance criterion (ß), is the standard of proof that the phenomenon exists. If the significance criterion (ð) is set at .05, the conventional level of significance, this means accepting a 5% chance of wrongly rejecting the null hypothesis: i.e. in five times out of a hundred such a finding could be obtained but it would be as a result of chance rather than a true reflection of the situation. Findings that have p-values of below 0.10 will also be discussed as they are 'approaching significance.'

Study power

Having sufficient statistical power ensures that we do not fail to reject the null hypothesis when it should in fact be rejected (known as Type II error): i.e. that we do not fail to reject the claim that the programme has had no effect when there is good reason to reject that claim. Statistical power (ß) is not independent of four other parameters of statistical inference: the significance criterion (ð), sample size (n), effect size (ES) and the type of statistical significance test used.

Summative evaluation

Summative evaluation is a method of judging the worth of a program at the end of the program activities. It focuses on outcomes.

Time 0, Time 1, Time 2

In the outcomes study, data were collected from children over three sessions at each of the three data collection time points (Time 0; Time 1 - 8 months; Time 2 - 12 or 16 months) for each of the two cohorts.

Appendices

Appendix 1: Process Study data collection

Participants	Method	Year	Number Sampled	Number Participated	Response Rate %
Barnardos staff	Face-to face Interview	1	10	10	100
		2	3	3	100
		3	5	5	100
School Principals	Face-to face Interview	1	4	4	100
		2	4	3[2]	75
		3	8	8	100
Class Teachers	Telephone Interview	1	11	4	36
		2	n/a	n/a	n/a
		3	31	16	52
Volunteers	Postal Questionnaire	1	23	21	91
		2	89	67	75
		3	84	80	95
Volunteers	Focus Group	1	23	12	52
		2	40	22	55
		3	84	44	52
Children	Face-to face Interview	1	55	13	23
		2	n/a	n/a	n/a
		3	29	26	90
Children	Observation	1	55	7	13
		2	n/a	n/a	n/a
		3	29	24	83
Parent	Interview	1	55	7	13

Outcomes Study Data Collection

Participants	Method	Time point	Year (RCT cohort)	Number Sampled	Number Participated	Response Rate %
Study Children	Standardised, criterion-referenced, and Likert scales	Pre-programme	2 (cohort 1)	113	113	100
			3 (cohort 2)	116	116	100
		Post-programme	2 (cohort 1)	113	113	100
			3 (cohort 2)	116	114	98
		Follow-up	2 (cohort 1)	113	113	100

Participants	Method	Time point	Year (RCT cohort)	Number Sampled	Number Participated	Response Rate %
			3 (cohort 2)	116	99	85
Teachers	Survey	Pre-programme	2 (cohort 1)	29	28	97
			3 (cohort 2)	31	29	94
		Post-programme	2 (cohort 1)	29	24	83
			3 (cohort 2)	31	28	90

One school principal chose not to participate as he/she had decided at that point to discontinue with WoW as of the end of the 2010 school year. The Barnardos team informed the CFRC research team that this decision was due to small class numbers in the school and an adequate supply of whole school literacy supports.

Appendix 2: Use of Time 2 data from two time points

The Time 2 data were collected at two different time points. For 1st class control children, Time 2 data were collected in September (12 months after Time 0); for the remainder of the students (1st class intervention, 2nd class control, 2nd class intervention), Time 2 data were collected the following January (16 months after Time 0). A statistically significant impact of the intervention was observed at Time 2 on Phonemic Awareness. However, this impact of the program could have been due to when the Time 2 data were collected from the 1st class control children. That is, did the decision to collect follow-up data on 1st class control children at 12 months rather than 16 months underestimate the gains made by the 1st class control group and, as a consequence, is the observed programme impact explained by the time at which data were collected?

Class year modified the impact of the programme. There was a statistically significant programme impact on the Phonemic Awareness measure (ß = .16, p = .01) and the WIAT SWR measure (ß = .16, p = .00) among only the 1st class children. The analyses have also shown that cohort modified the impact of the programme, as greater gains were made among the second group of children to receive the intervention. Further analyses indicated that the impact of class year was explained in part by cohort. This was considered pertinent as the same data collection procedure was used for both cohorts and, if the data collection procedure accounted for the observed programme impact, this should have been true for both cohorts.

The results of an ANCOVA analysis of scores on Phonemic Awareness that controlled for scores on the dependent variable from Time 0 (i.e., before the intervention began) indicated that the interaction between study condition, cohort, and class was statistically significant, $F(7, 194) = 3.10$, $p < .001$, and that class year interacted with study condition only for cohort 1. For cohort 1, a statistically significant impact of the programme was observed only for the 1st class (mean difference = 1.41). By contrast, in cohort 2 a statistically significant impact of the programme was observed for both the 1st class (mean difference = 3.93) and the 2nd class (mean difference = 3.18).

The difference between intervention and control groups among 2nd class children in the second cohort approached conventional levels of statistical significance, $F(1,35) = 3.78$, $p = .06$. The effect size was $d = 0.66$, which is slightly larger than a moderate effect size as defined by Cohen (1988). Parallel analyses were conducted using data for the 1st class students in cohort 2. The results were very similar. The difference between the treatment and control groups was statistically significant, $F(1,64) = 6.20$, $p = .02$. The effect size was $d = 0.62$, which is very similar to that found for the 2nd class children. The difference in the statistical significance of the results for the 1st and 2nd class students is explained by the smaller sample size of 2nd class cohort 2 children ($n = 38$) versus the 1st class cohort 2 children ($n = 67$).

In addition, there was a significant interaction between study condition, class year, and gender on WIAT SWR ($p = .01$) and an interaction approach statistically significance on Phonemic Awareness ($p = .09$). The analysis shows that boys made greater gains in the intervention group than the control group, and this was the case for 1st class and 2nd class children. In contrast, girls made greater gains in the intervention group than the control group only in 1st class, while in 2nd class girls made greater gains in the control group.

WOW

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Barnardos