Let's Go Back in the Time Machine: An Investigation into the Impact of Strategy-Based Reading Interventions on Year 4 Pupils' Comprehension Skills

The STeP Journal
Student Teacher Perspectives

University of Cumbria
Vol 6(1) pages 17-31

Laura Dunkling
University of Cumbria

Abstract
This study explored the impact of increased reading interventions (with a focus on strategy-based teaching) on Year 4 pupils' reading comprehension skills. An experimental group of 9 pupils participated in daily reading interventions from the beginning of January to the end of March to improve their competence in using the following comprehension strategies; inference, prediction, summarisation, and activating prior knowledge (from inside and outside of the text). The findings demonstrated that all pupils made progress in their reading comprehension ages and qualitative responses to reading comprehension questions, compared to 33% of pupils in the control group making progress. Over the course of the interventions, the pupils also demonstrated an increase in explicit use of strategies in their responses to comprehension questions. Although some pupils made more progress than others, the findings yielded from this study support the importance of helping struggling readers through increased reading interventions and explicit tuition.

Introduction
Reading attainment in the UK was recently described by the Department for Education to "tell a depressing story" (Department for Education, 2015: 3). 1 in 5 children leave primary school being unable to read to near age-related expectation, which then leads to poor performance at GCSE level, and higher risk for those children entering a life of unemployment and poverty (Lawton and Warren, 2015: 4). The Department for Education identified that the most significant reason as to why so many children were unable to read to an age-related expectation, is that effective reading strategies are not implemented into teaching in the early primary classroom (i.e. in Key Stage 1 and early Key Stage 2), meaning that many children in Year 6 are taking SATS reading examinations without a firm grasp of comprehension skills and strategies (Department for Education, 2015: 7). Unfortunately, as found by a wide body of research, it is common for children to have difficulties in comprehending information that they have read (Klinger, Vaughn, and Boardman, 2007). If left unaddressed, this leads to a widening gap of academic attainment later in secondary education, since it is vital that students are able to access and master academic content at a higher-level in order to secure good GCSE grades (Shanahan, 2005: 3). The government has introduced strategies into UK schools in order to improve reading outcomes for children, including the Year 1 phonics screening process, and the Read on, Get on campaign, which has a target to ensure that 95% of children in the UK can read well by the time they are 11 years of age (Douglas and Lawton, 2016: 3). However, the National Literacy Trust recognises that at present, more approaches need to be adopted in order to specifically improve children's reading comprehension skills (Clark and Teravainen, 2017: 5). This project investigates the effectiveness of delivering additional interventions to Year 4 children whose reading comprehension attainment is below age-related ability. By discussing the findings from the present study in the light of existing research and Vygotsky's social learning approach, I argue that increased reading time and teacher scaffolding have a noticeably positive impact on some children's reading comprehension age and competency in answering comprehension based questions in guided reading lessons. The implication gained from this study is to address comprehension difficulties effectively, by delivering

Citation
Dunkling, L. (2019) 'Let's go back in the time machine: an investigation into the impact of strategy-based reading interventions on Year 4 pupils' comprehension skills', *TEAN journal,* 6(1), pp. 17-31

extra reading lessons and explicitly teaching pupils comprehension strategies, so children have a better chance of succeeding in reading throughout their education.

Literature Review

Vygotsky's social learning approach proposes that a child's learning initially develops at a social (inter-psychological) level, before it becomes internalised in the child's mind at an internal (intra-psychological) level (Vygotsky, 1978: 57). This social approach also proposes that a child's inter-psychological processes are most effectively developed when the child is interacting in their 'zone of proximal development' (Vygotsky, 1978: p.82). A child's zone of proximal development can be defined as "the zone that a person's potential for new learning is strongest" (Fabes and Martin, 2001: 42). In relation to learning reading comprehension skills, it has been proposed that children are most likely to succeed when they are exposed to the following factors in their zone of proximal development; direct instruction on how to interpret information from the text by using each individual strategy (through high-quality teacher scaffolding), small (targeted) group instruction, texts which are well suited to the child's reading ability and frequent exposure to guided reading sessions (Antonacci, 2000: 21). The social approach to learning proposes that the child engages with reading socially through the aid of these factors, which then stimulates reading comprehension becoming a combination of internal intra-psychological skills, which the child can then apply independently when reading unfamiliar texts (Antonacci, 2000: p.24). Historically, Vygotsky's social learning approach has been supported by many scholars, including Rogoff's theory of guided participation (1990), which was inspired by Vygotsky's approach (1978), but extended from his theory by investigating the processes involved in the teacher-child communication systems, by exploring face-to-face interaction through observational research (Rogoff, 1990: 58). Vygotsky's approach (1978) has been incredibly beneficial in helping teachers to provide their students with guidance to help them move their cognition forwards (Parilla, 1995: 8). Vyotsky's social learning theory (1978) has also made a valuable contribution to the implementation of guided reading lessons in the classroom, since it has provided teachers with critical knowledge of how to encourage their students to efficiently use comprehension strategies, thus leading to the development of effective independent reading skills (Fountas and Pinnell, 1996: 26).

Reading comprehension refers to the process involved in obtaining meaning from a text, through the effective use of comprehension strategies and development of mental representations of meaning (Woolley, 2011: 16). Effective comprehension involves the interaction of a wide range of strategies, including summary, questioning, prediction, reference and inference (McGee and Johnson, 2003: 50). There is a wide yet continually growing body of research which demonstrates that social learning factors (increased teaching time, teacher scaffolding, exposure to text and reading opportunities) have a significant impact on children's reading comprehension attainment. Coyne et al (2009) delivered reading interventions to Year 1 pupils who were slightly behind with their reading comprehension skills (p.223). The interventions involved direct teaching of comprehension strategies involving story-maps, story rehearsal and mnemonics (p.231) through extra intervention lessons in the afternoons for 6 months. The results demonstrated that 81% of pupils' reading comprehension ages (based on multiple choice test-scores) increased significantly as a result of the interventions (p.239), thus supporting the important role of teacher scaffolding and increased reading opportunities in the development of comprehension skills. Similar findings are further demonstrated in a wide body of research studies, which investigate the impact of additional reading interventions on reading comprehension attainment. Blickenstaff et al (2013) conducted a series of intervention groups in Year 4 (children aged 8-9 years), including children who were working at age-related expectation in reading comprehension, children who were slightly below age-related expectation, and children who had developmental and cognitive disabilities (p.5). The researcher encouraged the children to read a variety of fiction texts (which were pitched appropriately to their age and reading ability), taught all children how to use the '5-finger re-tell' method, and continually asked questions including *What was*

the beginning of the story? What was the problem in the story? and *How was the problem solved?* (Blickenstaff et al, 2013: 8). The findings from the study yielded a significant increase in comprehension attainment after the interventions, shown by test results using the 5-finger questioning method (p.13). Again, this supports that increased exposure to reading books, teacher scaffolding and explicit tuition of comprehension strategies (the 5-finger method) has a positive impact on children's attainment in reading comprehension and ability to understand the meaning conveyed in texts. Muller's study (2016) involved conducting an intervention group with struggling readers aged 7-10 years to improve their inference skills (p.4). The intervention lasted for five days, and involved teaching the following strategies to the children; understanding the benefits of inference, modelled instruction of inferring meaning through reading passages, and using a graphic organiser to help understand inference, which then lead to a post-intervention assessment of the children's inference abilities (Muller, 2016: 18). The results showed (based on the post-assessment) that every student made at least one year's progress in inference (according to the Fountas and Pinnell assessment) (p.33), and by the end of the intervention period, only one student was below age-related expectation, compared to all students being below age-related expectation prior to the interventions (Muller, 2016: 36). In particular, the younger children (aged 7-8 years) made the most progress as a result of the interventions (p.37). The review of recent research demonstrates that focused intervention, increased reading time and targeted teaching support has a positive impact on children's comprehension skills, thus showing support for Vygotsky's social learning approach (1978) and the important role of high-quality teaching in improving children's reading abilities.

In contrast to the previous papers discussed, there are studies that conducted similar research, which demonstrate that increased reading interventions do not have a significant impact on pupils who are below age-related attainment ability in reading comprehension. Paul and Clarke (2016) conducted a study which involved delivering reading interventions across schools in Northern England, to children in Year 7 and Year 8 who were struggling with reading comprehension (p.116). The interventions involved regular reading 'booster lessons' being delivered by a trained teaching assistant, and the impact was measured by using Pearson Assessment Comprehension materials (Paul and Clarke, 2016: 119). Overall, the results showed that the progress made was only small and not to any statistical significance (p.123). Similar findings were also demonstrated in Vaughn et al's study (2012), which conducted a longitudinal intervention to help Year 6 pupils who were behind in reading comprehension attainment to achieve age-related ability in Year 8 (p.518). The interventions involved teacher-led lessons, involving reading passages of text, identifying the meaning of complex vocabulary, summarising what they have just read and making inferences (Vaughn et al, 2012: 519). The findings demonstrated that despite three-years of continual intervention, most of these pupils continued to demonstrate below age-level proficiency in reading comprehension through to Year 8 and no significant gains were made in reading comprehension attainment (p.521). The conclusions drawn from Vaughn et al's study (2011) were that the pupils had intractable reading difficulties, and this provides a 'strong rationale' to believe that reading comprehension competency is likely to be determined by psychological factors, such as a child's cognitive ability (p.523). However, it is vital to recognise that although Paul and Clarke (2016) and Vaughn et al (2012) conducted interventions with pupils aged 10 years and above. Bergin and Bergin (2011) propose that reading interventions should be heavily focused in early childhood, as the human brain is at its peak neural plasticity (p.24), meaning that the neurons are more flexible and synapses are more likely to connect to one another, thus enabling new skills to be learned and more quickly established (Kolb and Gibb, 2011: 267). Dehaene-Lambertz et al (2006) conducted MRI studies on young children (aged 4 years) and adults, and found that more areas of the brain were active when the children were participating in reading activities (both left and right hemispheres of the brain) (p.14242). In contrast to this, the areas of the adults' brain which were activated were limited to the auditory cortex and frontal lobes of the brain (Dehaene-Lambertz et al, 2006: 14243). Therefore, it is widely believed by researchers and teachers that social aspects of teaching (i.e. exposure to books, teacher scaffolding and additional

interventions) should be implemented when children are below 10 years, in order to have maximum success (Thomas and Knowland, 2009: 17).

Research which investigates the relationship between increased reading intervention and reading comprehension attainment has been criticised for being too reliant on quantitative data, such as reading ages and examination scores (Schatschneider and Lonigan, 2010: 348). Quantitative data functions as very useful information for scholars and teachers in educational research, as it is an effective diagnostic tool to identify progress gains, gaps in knowledge and whether children have a comprehension reading age close to their chronological age (Rahman, 2016: 101). However, it is important to acknowledge that qualitative data (such as pupils' responses to direct questioning) can be extremely valuable when assessing pupils' understanding of text and ability to use comprehension strategies, such as inference, prediction and summary. Therefore, it has been argued that many existing research papers are dismissive of the value of pupils' responses and the quality of reasoning provided by children when they justify their answers (Pearson and Cervetti, 2015: 19). It has also been identified that the wide body of existing research which studies reading comprehension has an "enduring interest in inference", and other skills of comprehension are often under-researched (Perfetti and Stafura, 2014: 25). The Education Endowment Foundation proposes that successful reading comprehension consists of the following skills; prediction, summarisation, inference, and activating prior knowledge (from previous reading in the text and applying own knowledge of real-life context) (2017: 12). The present study contributes to the gap in the existing literature by examining the effects of increased reading interventions on pupils' reading comprehension abilities through both a quantitative and qualitative perspective, and by explicitly teaching all of the reading comprehension skills proposed by the Education Endowment Foundation, with an aim to improve reading comprehension ability in children who have a reading comprehension age of below age-related expectation (2017: 12).

Methodology

The present study is located in a junior school in England. The 9 pupils involved in the experimental group were aged 8 years, 6 months to 9 years, 3 months and were in a Year 4 class. Two pupils are SEN, and two pupils are pupil premium. These pupils were selected to participate in the interventions because their reading comprehension skills were below age-related expectation prior to the study (expected reading comprehension age is 9 years), judged by their reading comprehension age data (reference table 1). The 9 pupils in the control group are also in Year 4, and are aged between 8 years, 4 months to 9 years, 4 months and are in a different class. One pupil is SEN and two pupils are pupil premium (reference table 2). Permission was sought from the Head of School to proceed with this project, and from the class teacher to use his data in my control group. By English law, children under 16 can give informed consent to participate in research as long as they have sufficient understanding of what is involved (Flewitt, 2005: 3). The experimental group were briefed prior to the lessons, and were given clear information that the reading lessons would be of similar format to the daily guided reading lessons, that the purpose of the lessons was for a university project and I wanted to investigate what teaching methods would best help them with their reading. I also informed them that I would use their reading comprehension test results and their responses to questions in my project, but their names would not be used in the writing. They were also given the right of withdrawal from the reading interventions at any point.

Table 1. Pupil information (experimental group) prior to the interventions.

Pupil	**Gender**	**Additional Needs.**	**Chronological Age.**
Pupil 1	Female	None	8 years, 4 months.
Pupil 2	Female	None	8 years, 8 months.
Pupil 3	Female	None	8 years, 8 months.
Pupil 4	Male	Pupil premium	8 years, 10 months
Pupil 5	Male	None	8 years, 11 months.
Pupil 6	Male	SEN	9 years, 1 month.
Pupil 7	Male	Pupil premium	9 years, 2 months.
Pupil 8	Female	SEN	9 years, 3 months.
Pupil 9	Female	None	9 years, 4 months.

Table 2. Pupil information (control group) prior to the interventions.

Pupil	**Gender**	**Additional Needs.**	**Chronological Age.**
Pupil 1	Male	SEN	8 years, 4 months.
Pupil 2	Female	None	8 years, 9 months.
Pupil 3	Female	None	8 years, 10 months.
Pupil 4	Female	None	8 years, 10 months.
Pupil 5	Female	None	8 years, 11 months,
Pupil 6	Male	None	9 years, 2 months.
Pupil 7	Male	None	9 years, 3 months
Pupil 8	Male	Pupil premium.	9 years, 4 months.
Pupil 9	Male	None	9 years, 4 months.

I adopted a strategy-based approach to teaching the features of comprehension, as this has been shown to improve reading comprehension when they are modelled by the teacher and practised regularly (Education Endowment Foundation, 2017: 12). It has also been proposed that a primary reason as to why some children demonstrate below age-related attainment in comprehension is that they lack knowledge of the strategies to apply to reading texts (Kispal, 2008: 17). The reading strategies, which I taught the pupils, were the main comprehension skills proposed by the Education Endowment Foundation (2017: 12), by improvising memorable strategies (reference table 3).

Table 3. The strategies employed in the comprehension lessons, and excerpts of dialogue between myself and the pupils**.**

Comprehension Skill.	**Strategy**	**Teacher questioning.**	**Pupil response.**
Inference	"Show me, don't tell me"	Teacher: What do you think "*His ears were as sharp as spines"* might be showing and not telling? (King-Smith, 1987: 12).	Pupil 7: "*Does it show that he's good at hearing and he can hear everything?".*
Prediction	"What clues can we find when we go back in the time machine, in order to go forward in the time machine?"	Teacher: (Pupil's name) tell me what you think will happen when we go forward in the time machine, by using clues from going back in the time machine?	Pupil 2: *"I think he'll get hit by a car because when I go back in the time machine, it says no-one noticed him".*
Summarisation	"Tell me what happens in a chapter in one sentence"	Teacher: Who can tell me what happened in chapter 3 in one sentence?	Pupil 4: *Max was ran over by a bike, got concussion and now he talks backwards.*
Activating prior knowledge (within the text).	"Let's go back in the time machine".	Teacher: Why do you think Pa gave the children a "*long lecture about the problems of road safety for hedgehogs?"* (King-Smith, 1987: 13).	Pupil 1: *"Is it because his grandfather and auntie were ran over by a car, and he's worried that his children will get ran over too?"*
Activating prior knowledge (outside of the text).	"What do I know about my world to help me understand what the author means?"	Teacher: What do you see at a crossing on a road which might explain what the *"glowing orange globe"* might be? (King-Smith, 1987: 19).	Pupil 8: *"They're the lights on poles at zebra crossings that tell you when you can cross".*

The interventions were conducted daily for 30 minutes, 4 times a week for a total of 8 weeks, and I chose to deliver the interventions in a small group setting of 9 pupils in a 'guided-reading' style structure. The guided reading method has many advantages which are beneficial to children, including the opportunity to develop comprehension skills through deep discussion and gain ideas from one another, in complement to receiving targeted instruction from the class teacher about comprehension strategies and vocabulary (Pinnell and Fountas, 2012: 4). I chose to focus the intervention lessons on

Dick King-Smith's The Hodgeheg, as it has been recommended as an effective book for Lower Key Stage 2 guided reading lessons because of the challenging vocabulary and the opportunity to apply ideas from the book "in new contexts" (Wray and Medwell, 2008: 84). The initial five lessons were spent introducing each comprehension strategy (one lesson per strategy), as it has been proposed that children can read most effectively when they are aware of a comprehension strategy that can be used to help them understand complex elements of what they are reading (Education Endowment Foundation, 2017: 12). With the children, I taught them how to use the strategy and provided children with examples, and they were required to practise using the strategy. Our ideas were recorded on colourful posters, which were visible to the children in the subsequent lessons. In the following lessons, the pupils took it in turns to read pages from the book and I would ask specific questions to the pupils, which involved using the strategies that I taught them. In order to assess the pupils' reading comprehension ages prior to the interventions, at mid-point and post-interventions, I used the Accelerated Reader software. This is a computerised method of formative assessment to measure children's reading comprehension ages, and the test involves children reading a text excerpt and answering questions which involves children using comprehension strategies (Topping and Fisher, 2003: 269). Research has shown the accelerated reader assessment to have a 95% reliability, and be as reliable as any other method for comprehension assessment (Topping and Fisher, 2003: 275). In order to gain qualitative data about how the pupils used the comprehension strategies in their responses, I recorded field notes during every session to monitor the progress.

Results and Discussion

Does increased reading interventions involving an explicit tuition of comprehension strategies, have an impact on the reading comprehension ages of children in Year 4?

In the experimental group, there was a mean reading comprehension age progress gain of 1 year, 1 month between the pre-intervention and post-intervention testing two-months of interventions (reference table 4), in contrast to an average of 1 month's progress gain in the control group, who received no additional intervention (reference table 5). This acts as strong evidence to suggest that additional reading interventions (which involve increased time reading books and teacher support) have a positive impact on the comprehension skills of Year 4 children, thus supporting the important role of social factors in children's learning. The positive impact of the reading interventions has also been demonstrated by the fact that 100% of pupils in the experimental group made progress between the pre-intervention and post-intervention testing period (reference table 4), compared to 33.3% of pupils making progress in the control group (reference table 5), suggesting that the strategy-based approach to teaching reading does improve children's comprehension skills, as recommended by the Education Endowment Foundation (2017: 12). A particularly important finding gained from this study is that in the experimental group, no post-intervention comprehension ages remained the same or fell below the pre-intervention comprehension ages (reference figure 1). In contrast to this, 66.6% of the post-intervention comprehension ages in the control group remained the same as or fell below the pre-intervention score tests (reference figure 2), which has an important implication that children who are behind in their reading comprehension skills need to be addressed and targeted with increased intervention, in order to ensure that they do not continue to fall behind. A wide-scale, international study conducted by the OECD (2010) found that 9 year old children who read daily or almost daily consistently score higher in reading comprehension assessments, and are at less risk of falling behind in reading than those who only read once a week (2010: 4). The fact that these reading interventions took place on a daily basis may have been a good solution to ensure that the children in the experimental group didn't fall further behind, thus supporting that social learning factors (increased exposure to books, teacher scaffolding and strategy based teaching) have a positive impact on the reading comprehension attainment of Year 4 pupils. When discussing the present study in the light of the neural plasticity hypothesis, the findings also support that the brains of 8-9 year old pupils are still

receptive to additional reading interventions, and this is reflected in the progress gains in reading comprehension ages (reference table 4).

Table 4. Pupil information about reading comprehension age before, midpoint and after the interventions (experimental group).

Pupil	Pre-intervention reading age (years and months).	Mid-point reading age (years and months).	Post-intervention reading age (years and months).	Progress gain/ decrease (years and months).
Pupil 1	8 years, 3 months	8 years, 3 months	9 years, 11 months	+ 1 year, 8 months
Pupil 2	7 years, 11 months	8 years, 1 month	9 years, 9 months	+ 1 year, 10 months
Pupil 3	8 years, 3 months	8 years, 9 months	8 years, 9 months	+ 6 months
Pupil 4 (PP)	8 years, 3 months	8 years, 7 months	9 years, 1 month	+ 10 months
Pupil 5	8 years, 7 months	8 years, 8 months	8 years, 9 months	+ 2 months
Pupil 6 (SEN)	6 years, 10 months	7 years, 10 months	8 years, 4 months	+ 1 year, 6 months
Pupil 7 (PP)	8 years, 0 months	8 years, 1 month	8 years, 11 months	+ 11 months
Pupil 8 (SEN)	7 years, 3 months	8 years, 3 months	9 years, 5 months	+ 2 years, 2 months
Pupil 9	8 years, 2 months	8 years, 4 months	8 years, 8 months	+ 6 months

Table 5. Pupil information about reading comprehension age before, midway and after the interventions (control group).

Pupil	Pre-intervention reading age (years and months).	Mid-point reading age (years and months).	Post-intervention reading age (years and months).	Progress gain/ decrease (years and months).
Pupil 1 (SEN)	6 years, 3 months	6 years, 3 months	6 years, 3 months	+/- 0 months
Pupil 2	8 years, 1 month	8 years, 2 months	8 years, 8 months	+ 7 months
Pupil 3	8 years, 8 months	8 years, 7 months	8 years, 7 months	- 1 month
Pupil 4	8 years, 6 months	8 years, 6 months	8 years, 3 months	- 3 months
Pupil 5	7 years, 11 months	8 years, 0 months	8 years, 8 months	+ 9 months
Pupil 6	7 years, 10 months	7 years, 6 months	7 years, 7 months	- 3 months
Pupil 7	7 years, 7 months	7 years, 8 months	7 years, 8 months	+ 1 month
Pupil 8 (PP)	7 years, 2 months	7 years, 0 months	6 years, 11 months	- 3 months
Pupil 9	6 years, 6 months	6 years, 5 months	6 years, 6 months	+/- 0 months

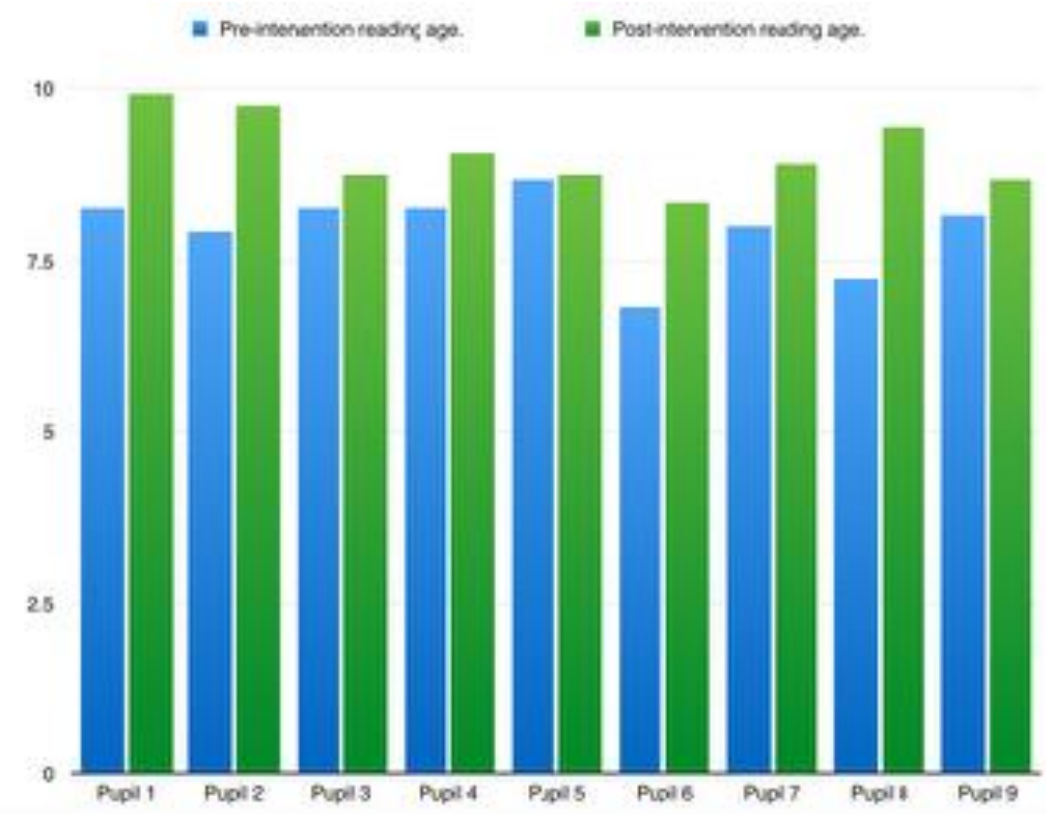

Figure 1. Bar chart to show the experimental group's progress in reading comprehension age (pre-intervention and post-intervention).

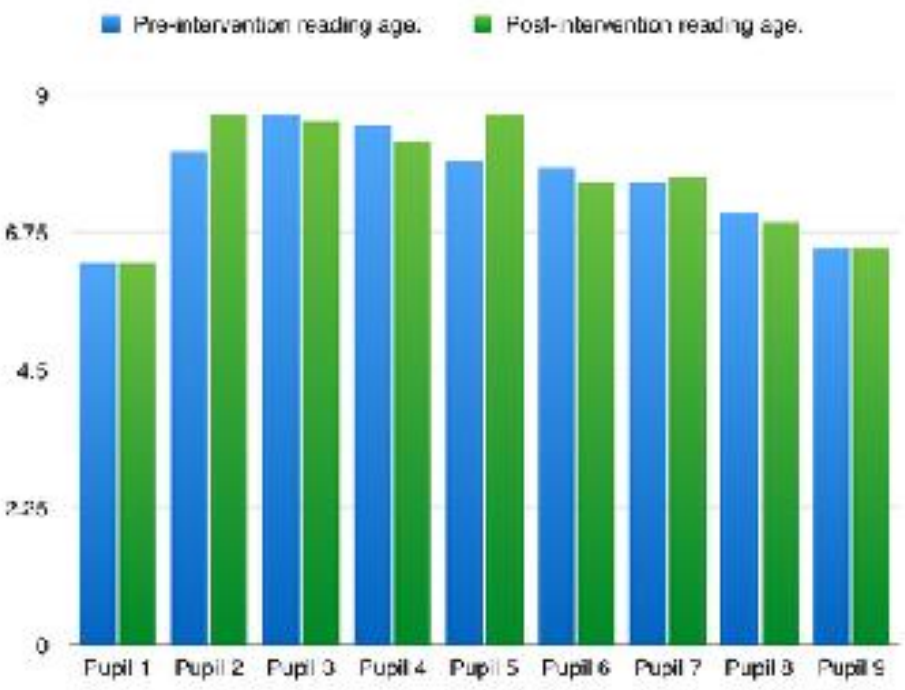

Figure 2. Bar chart to show the control group's progress in reading comprehension age (pre-intervention and post-intervention).

However, the fact that so many children's post-intervention reading comprehension ages in the control fell below the pre-intervention comprehension ages raises questions as to whether the accelerated reader test is reliable, or whether the children's reading skills are 'going backwards'. As mentioned previously, the accelerated reader test has shown to have a 95% reliability rate (Topping

and Fisher, 2003: 275). Wanzek et al's study (2010) conducted a longitudinal review of research over 20 years, and found that year 4 children who are behind in their reading, tend to experience the 'fourth grade slump' (p.909). This means that children in Year 4, who are reading below an age-level expectation, experience a sudden decline in assessment scores because they are struggling to thrive and meet appropriate reading age expectations due to increasingly complex demands being expected of them (Wanzek et al, 2010: 910), thus emphasising the importance of identifying when children are not achieving well in reading, and delivering appropriate interventions before the gap widens further (p.911). The fact that 0 pupils in the experimental group experienced the 'fourth grade slump' in the reading comprehension ages acts as strong evidence to support that the strategy-based interventions helped the pupils in the experimental group improve upon their comprehension skills. 44% of the pupils in this group achieved age-related expectation (9 years) and above, and the remaining 56% of pupils were close to reaching a Year 4 expected comprehension age.

Although the findings from the present study demonstrate that on average, the reading interventions have been successful in improving children's comprehension skills, there are individual differences in the performance rates of each individual child. Pupil 8 made a comprehension age gain of 2 years, 2 months, whereas Pupil 5 only made 2 months progress, which suggests that the strategy-based interventions worked better for some pupils, than it did for others. A particularly interesting finding was that the strategy-based tuition worked very well for Pupil 6 who has autism, as they made a progress gain of 1 year, 6 months. It has been demonstrated in many studies that children with autism experience great difficulties in reading comprehension, particularly in inference and understanding non-literal meaning (Lindgren et al, 2009: 26). Pupil 5 only made 2 months progress, and Pupils 3 and 9 made 6 months progress, and there are reasons which could be explanatory for this; these children could be less motivated to read at home or enjoy reading less than the other children in the group, as research has demonstrated that children who make more progress in reading tend to be more motivated to read, than those who make little/no progress (Wigfield et al, 2018: 435). It is also important to recognise that children are different, and they all have preferences for different learning styles (Allcock, 2010: 71). As the class teacher of these children, my following steps would be to find out what was not working in the interventions through a pupil voice method, encourage them to read at home and continue to address their emerging needs for reading comprehension, but potentially employ different strategies in my lessons.

Does increased reading interventions have an impact on pupils' competence of using comprehension strategies in verbal responses to reading questions?

The Education Endowment Foundation propose that in order for children to demonstrate full competence in their reading comprehension skills, they should go through the processes of engaging collaboratively with the strategy being used (with the teacher and other children), which then leads to the teacher gradually releasing responsibility to the pupils using reading comprehension strategies independently (2017: 12). During the beginning of the reading interventions, the pupils were reliant on my prompts in order to help them use the strategies accurately, with little confidence, guesses (questioning) and adult scaffolding being frequent;

> *Teacher: The author has mentioned that the road was a "Bad place to cross that"* (King-Smith, 1987: 8). *What do we know about our world that makes a road a bad place to cross?*
> *Pupil 8: I don't know - it doesn't tell us.*
> *Teacher: Okay - remember about thinking about what we know about our world. Imagine if I said that the road outside of school was a bad place to cross. What do you think I would mean by that?*
> *Pupil 3: Could it mean that it is dangerous?*
> *Teacher: Very good start! What could be on the road that would make it dangerous?*
> *Pupil 3: Lots of traffic.*

Teacher: Excellent! So what do you think Pa means by the road was a bad place to cross that?
Pupil 8: Oh, does it mean that there was lots of cars on the road and it was unsafe?

Initially, the pupils experienced difficulty with deducing inference and relied on my cues and hints to help them. It was particularly evident in pupil 6, who has autism. As mentioned previously in this paper, research has demonstrated that children with autism have a tendency to experience difficulties with inference and non-literal meaning (Lindgren et al, 2009: 26). The extract below demonstrates this pupil being unable to understand inference in the book.

Teacher: Max the hedgehog has been described as being bright from "The moment his eyes had opened and while his prickles were still soft and rubbery" (King-Smith, *. What is the author showing and not telling about his age, (pupil 6)?*
Pupil 6: That his eyes had opened.
Teacher: Yes his eyes had first opened. At what age do you think this happens?
Pupil 6: All the time.
Teacher: Okay - let's look at his prickles. What do we know about an adult hedgehog's prickles?
Pupil 2: That they are very sharp like daggers.
Teacher: Excellent! Now it says in the book that his prickles were still soft and rubbery. (Pupil 6), what age do you think his prickles were still soft and rubbery?
Pupil 6: I don't know.

As the interventions progressed, pupils demonstrated more collaborative discussion using the strategies and built their responses upon the ideas of one another:

Teacher: After Max was knocked over by a cyclist. He said "I got a head on the bump" (King-Smith, 1987: 24)- *why do you think he said that?*
Pupil 7: I think he meant that he got a bump on the head.
Pupil 1: I think it is showing and not telling that he is confused after he hit his head.
Pupil 3: Yes! And he got concussion.
Pupil 4: So the writer is showing and not telling that he is talking backwards because he hit his head and it has made his brain confused.
Teacher: Fabulous responses! Well done boys and girls.

This then continued to lead most of the pupils being able to use reading comprehension strategies independently in their responses (without prompts).

Teacher: What does the author mean by "Max could hardly wait for the next dawn"? (King-Smith, 1987: 64).
Pupil 5: He is showing and not telling that he is excited for the next day.

Teacher: Why do you think the noise she made meant nothing to Max? What do we know about our world that could help us to answer this?
Pupil 7: Because Hedgehogs can't talk, and humans can. Maybe they can't understand our language?

The qualitative data yielded from this study demonstrates how the pupils' became more confident in using their reading comprehension strategies independently. This data provides an insightful perspective into how my pupils have made progress throughout the interventions, and how their independent use of comprehension strategies has increased. Valuable findings have been gained which could not have been yielded from the quantitative data (reading comprehension ages), such as that although some pupils only made small progress in their reading comprehension ages, their

responses given in the interventions demonstrate a greater degree of understanding of reading comprehension strategies.

Conclusion

The present study has yielded strong quantitative and qualitative evidence to support that increased reading interventions (through a strategy-based approach to teaching reading comprehension) has a noticeable impact on the reading comprehension ages and skills of children in Year 4, who are below age-related ability in reading. The findings also act as support for Vygotsky's social learning theory (1978) and the strong influence of social learning factors (including adult-scaffolding and increased exposure to text) on the reading development of children, and also suggest that 8-9 year-old children still have sufficient neural plasticity in order for intensive reading interventions to have a positive impact. The implications gained from this study in light to existing research, is to ensure that struggling readers are identified early, and the areas of misconception are addressed through intensive interventions and monitoring, before it becomes too late in order to have a noticeable impact. As a teacher, I recognise that the interventions were more successful for some pupils than others, so I intend to monitor these particular pupils through continual regular interventions, and individual reading sessions with a skilled Teaching Assistant. I will further monitor the pupils who have made progress in the interventions to ensure that they continue to make good progress and do not fall behind. I acknowledge that there are limitations to the present study, including that the sample size was small, meaning that it was inappropriate to test for statistical significance. However, this leads to potential directions for future research, including investigating whether the strategy-based approach to teaching reading comprehension would be equally as effective in a whole- class context.

References

Allcock, S. J. and Hulme, J. A. (2010). Learning Styles in the Classroom: Educational Benefit or Planning Exercise? *Psychology Teaching Review*. 16(2), pp.67-79.

Antonacci, P. A. (2000). Reading in the Zone of Proximal Development: Mediating Literacy Development in Beginner Readers through Guided Reading. *Reading Horizons*. 41(1), pp. 19-33.

Bergin, C. C. and Bergin, D. A. (2011). *Child and Adolescent Development in Your Classroom*. Stamford, CT: Cengage Learning.

Blickenstaff, J. Hallquist, E. and Kopel, K. (2013). The Effects of Reading Strategies in Comprehension for Elementary Age Learners. *Master of Arts in Education Action Research*. Paper 2, pp.1-32.

Clark, C. and Teravainen, A. (2017). *What it means to be a reader at age 11: valuing skills, affective components and behavioural processes: An outline of the evidence.* The National Literacy Trust, 2017. Available from: https://literacytrust.org.uk/research-services/research-reports/what-it-means-be-reader-age-11-valuing-skills-affective-components-and-behavioural-processes/. (Accessed 2nd April 2018).

Coyne, M., Zipoli, Jr., R., Chard, D.J., Fagella-Luby, M., Ruby, M., Santoro, L., & Baker, S. (2009). Direct instruction of comprehension: Instructional examples from intervention research on listening and reading comprehension. *Reading & Writing Quarterly.* Volume 25, pp.221-245.

Dehaene-Lambertz, G., Hertz-Pannier, L., Dubois, J., Meriaux, S., Roche, A. and Sigman, M. (2006). Functional Organisation of Perisylvian Activation During Presentation of Sentences in Preverbal Infants. *Proceedings of the National Academy of Sciences of the United States of America.* 103(38), pp.14240-14245.

Department for Education. (2015). *Reading: The Next Steps: Supporting Higher Standards in School*. London: DfE Publications.

Douglas, J. and Lawton, K. (2016). *Read on, Get on: A Strategy to Get England's Children Reading*. Save the Children Report, 2016. Available from: https://literacytrust.org.uk/ documents/899/Read_On_Get_On_Strategy.pdf. (Accessed 2nd April 2018).

Education Endowment Foundation (2017). *Improving Literacy in Key Stage Two*. London: Education Endowment Foundation.

Fabes, R. and Martin, C. L. (2001). *Exploring Development Through Childhood.* Boston: Allyn and Bacon.

Flewitt, R. (2005). Conducting Research with Young Children: Some Ethical Considerations. *Early Child Development and Care*. 175(6), pp.553-566.

Fountas, I. and Pinnell, G. S. (1996). *Guided Reading: Good First Teaching for all Children*. Portsmouth, NH: Heinemann.

King-Smith, D. (1987). *The Hodgeheg*. London: Puffin Modern Classics.

Kispal, A. (2008). *Effective Teaching of Inference Skills for Reading: Literature Review*. London, England: National Foundation for Educational Research.

Klinger, J., Vaughn, S., & Boardman, A. (2007). *Teaching reading comprehension to students with learning difficulties.* New York, NY: Library of Congress.

Kolb, B. and Gibb, R. (2011). Brain Plasticity and Behaviour in the Developing Brain. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*. 20(4), pp.265-276.

Lawton, K. and Warren, H. (2015). *The Power of Reading: How the Government Can Unlock Every Child's Potential Through Reading.* Save The Children Report, 2015. Available from: https://readingagency.org.uk/newsThe%20Power%20of%20Reading%20low%20res%20%282%29.pdf. (Accessed 2nd April 2018).

Lindgren, K. A., Folstein, S. E., Tomblin, J. B., & Tager-Flusberg, H. (2009). Language and reading abilities of children with autism spectrum disorders and specific language impairment and their first-degree relatives. *Autism Research*. 2(1), 22-38.

McGee, A. and Johnson, H. (2003). The Effect of Inference Training on Skilled and Less Skilled Comprehenders. *Educational Psychology*. 23(1), pp.49-59.

Muller, R. R. (2016). The Effect of Explicit Teaching of Inferring on the Reading Comprehension of Students with Learning Disabilities in Middle School. Theses and Dissertations. Paper 2265, pp.1-56.

OECD (2010). *PISA 2009 Results: Learning to Learn: Student Engagement, Strategies and Practices.* Volume 3. Available from: http://www.oecd.org/education/school/programmeforinternationalstudentassessmentpisa/33690986.pdf. (Accessed 9th April 2018).

Parrilla, R. K. (1995). *Vygotskian views on language and planning in children*. School Psychology International. Sage Publications.

Paul, S. A. S. and Clarke, P. J. (2016). A Systematic Review of Reading Interventions for Secondary School Students. *International Journal of Educational Research.* Volume 79, pp. 116-127.

Pearson, P. D. and Cervetti, G. (2015). Fifty Years of Reading Comprehension: Theory and Practice. In: Pearson, P. D. and Hiebert, E. (eds). (2015). *Research-based Practices for Teaching Common Core Literacy*. New York, NY: Teachers College Press.

Perfetti, C. and Stafura, J. (2014). Word Knowledge in a Theory of Reading Comprehension. *Scientific Studies of Reading*. 18(1), pp.22-37.

Pinnell, G. S. and Fountas, I. C. (2012). *Research Base for Guided Reading as an Instructional Approach. Scholastic Publications.* Available from: http://emea-qa-ph.ws-sandbox.com/sites/default/files/GR_Research_Paper_2010_3.pdf. (Accessed 8th April 2018).

Rahman, M. S. (2016). The Advantages and Disadvantages of Using Qualitative and Quantitative Approaches and Methods in Language "Testing and Assessment" Research: A Literature Review. *Journal of Education and Learning*. 6(1), pp.102-112.

Rogoff, B. (1990). *Apprenticeship in Thinking: Cognitive Development in Social Context.* New York: Oxford University Press.

Schatschneider, C. and Lonigan, C. J. (2010). Misunderstood Statistical Assumptions Undermine Criticism of the National Early Literacy Panel's Report. Educational Researcher. 39(4), pp.347-351.

Shanahan, T. (2005). *Practical advice for teachers*. The National Reading Panel Report. Learning Point Associates/North Central Regional Educational Laboratory, University of Illinois at Chicago, 1-48.

Thomas, M. S. C. and Knowland, V. (2009). Sensitive Periods in Brain Development: Implications for Education Policy. *European Psychiatric Review.* 2(1), pp.17-20.

Topping, K. J. and Fisher, A. M. (2003). Computerised Formative Assessment of Reading Comprehension: Field Trials in the UK. *Journal of Research in Reading*. 26(3), pp. 267-279.

Vaughn, S., Wexler, J., Leroux, A., Roberts, G., Denton, C., Barth, A. and Fletcher, J. (2012). Effects of Intensive Reading Intervention for Eighth-Grade Students With Persistently Inadequate Response to Intervention. *Journal of Learning Disabilities*. 45(6), pp.515-525.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Psychological Processes*. London: Harvard University Press.

Wigfield, A., Guthrie J. T., Perencevich, K. C., Taboada, A., Klauda S. L., McRae, A., Barbosa, P. (2008). The role of reading engagement in mediating effects of reading comprehension instruction on reading outcomes. *Psychology in the Schools.* 45(5), pp. 432–445.

Woolley, G. (2011). *Reading Comprehension: Assisting Children with Learning Difficulties.* New York: Springer Publishing.

Wray, D. and Medwell, J. (2008). *Primary English: Extending Knowledge in Practice.* London: Sage Publications.

Wanzek, J., Wexler, J., Vaughn, S. and Ciullo, S. (2010). Reading Interventions for Struggling Readers in the Upper Elementary Grades: a Synthesis of 20 Years of Research. *Reading and Writing*. 23(8), pp.889–912.