

Linkword Languages in the classroom – success for children with dyslexia in learning French

Amy Brown

Dept of Public Health Policy and Social Sciences

Swansea University

SUMMARY OF MAIN RESULTS

1. A TEST OF KNOWLEDGE OF FRENCH VOCABULARY PRIOR TO THE STUDY FOUND THE NON DYSLEXIC GROUP WERE SIGNIFICANTLY BETTER THAN THE DYSLEXIC GROUP
2. AFTER TRAINING WITH LINKWORD THERE WAS NO DIFFERENCE BETWEEN THE TWO GROUPS IN PERFORMANCE. BOTH GROUPS INCREASED THEIR VOCABULARY SIGNIFICANTLY
3. HOWEVER THE DYSLEXIC GROUP IMPROVED ITS PERFORMANCE SIGNIFICANTLY MORE THAN THE NON DYSLEXIC GROUP AS A RESULT OF USING LINKWORD
4. BOTH GROUPS IMPROVED FOR BOTH RECEPTIVE AND PRODUCTIVE LEARNING
5. THE DYSLEXIC GROUP REPORTED SIGNIFICANTLY INCREASED ENJOYMENT AS A RESULT OF USING LINKWORD
6. BOTH GROUPS REPORTED LEARNING VOCABULARY AND GRAMMAR SIGNIFICANTLY EASIER WITH LINKWORD

“Linkword Languages” in the classroom – success for children with dyslexia in learning French

In the United Kingdom today, learning a foreign language is becoming an increasingly important skill as more and more opportunities open up for British job seekers in the European Market (Crombie, 2000). A good grasp of a modern foreign language is now not merely another qualification at GCSE or A level but a key opportunity for career expansion once school has been long forgotten. For example, speaking in the “Times Educational Supplement” (November, 2002) Digby Jones, the director general of the confederation of British Industry, stated that without a foreign languages qualification young people are less able to compete in global organisations or companies. Similarly in the same issue, Ian Mullen, chief executive of the British bankers association declared that, “We need a work force with expanding language skills as eighty percent of regulations governing the UK financial industry originate from Brussels”. Learning a foreign language is therefore not only a compulsory element of the national curriculum at present for children up to the age of sixteen (McColl, 2000), but also an important qualification for life.

Enhanced employability is not the only benefit of learning a foreign language. Atkinson (1992) suggests that the pupil benefits from a whole range of skills and knowledge through these lessons. For example, from a social viewpoint, they learn more about different cultures, have more opportunities for travel and European identity is fostered. Benefits are also seen from a cognitive developmental viewpoint. Cognitive learning is seen to improve, the pupil learns more about his or her own language structure and concentration is thought to increase.

Participation and success at language learning is therefore extremely beneficial to the child on educational, vocational and interpersonal levels. However, pupils are not necessarily meeting these targets. Dobson (1998) highlights concerns revealed in inspection reports by the HMI over pupil’s abilities in languages after five years of teaching. Pupils are also failing to learn languages to a high enough level. For example, Curtis (2002) reported that only 2.85% of all British pupils qualified in A level French in 2000 and an even lower percentage of 1.1% qualified in German. Stables & Wilkeley (1999) also found that when asked to rate subjects on how much they liked them, languages were paced at the bottom of the list by thirteen and fourteen year olds. Compared to children of the same age in European countries, British students are also lagging behind. Speaking more than one language is common there but not in Britain (McColl, 2000). All of this evidence suggests that despite the importance of languages as a skill for life, the majority of pupils are not gaining high enough competence in them to benefit from these opportunities.

The question of how to raise the number of pupils studying languages is central to present modern foreign language debate. The purpose, methodology and curriculum content have all been recently debated by The Nuffield Inquiry report (Moys, 1998), which expressed anxiety over the situation at present. It is now being recognised that older, traditional methods should not necessarily be discarded but complemented with newer ideas and strategies for increasing not only performance but motivation as well (Grenfell 1993).

Key – Word Method

One suggestion to how performance in foreign languages could be increased is that more learning strategies should be incorporated into teaching, (Nunan, 1995). Away from education, one such group of strategies that have shown to increase and aid encoding and recall of information in general is that of the numerous mnemonic strategies. These strategies, which are often visually based, have been used to increase recall of a number of objects such as faces, lists of items and positions of chess pieces (Eysenck & Keane, 2000). One such strategy that has been widely and practically used and has shown success in increasing recall is based on foreign language learning. Known as the key word method, it involves relating an English word to another English word that sounds like the foreign translation, through the use of imagery (Gruneberg, 1998). For example, the French for Hedgehog is “Herrisson” which sounds like the English phrase “Hairy son”. Therefore the learner visualizes an image that involves a hedgehog and a their “hairy son” interacting, such as a their son playing with a hedgehog. Therefore when the learner next hears the French word “Herrisson” they picture a “hairy son” in their minds eye and retrieve an image of the Hedgehog, as the two have become linked in memory. Similarly when translating the word Hedgehog into French, the learner again imagines this image of the Hedgehog and retrieves the phrase “Hairy son” from memory, which prompts the translated word “Herrisson”. Therefore an acoustic link connects the familiar key word to the unfamiliar word to be learned through the similarity of the sound of the two words. Imagery then links an interactive picture of the unfamiliar word with the familiar word (King – Sears, Mercer & Sindelar, 2002). Associations between the keyword and the translation are therefore strengthened whilst associations between the translations and other English words are reduced (Kaspar, 1993)

Recall has been shown to increase using this method of language learning in comparison to methods such as straightforward rote learning by many researchers. For example, Atkinson & Raugh (1975) presented participants with forty Russian words a day for three days. Half the subjects were given information on the key word method to learn the words and the other half acted as a control group and did not received any information. A vocabulary test was then given, with the key word group recalling on average 72% of the words compared to an average score of 46% for the control group. The participants were then told the experiment had finished but six weeks later were called back for another test. This time the key word group recalled 43% of the words compared to 28% correctly answered by the control group. Differences in scores between the key word and control groups were at both times highly significant suggesting that the key word methods played a crucial part in boosting recall for the vocabulary (Atkinson, 1975). Hogben & Lawson (1994) also supported this finding through using the method with students learning Italian. Recall for words learnt using the keyword method was significantly higher than words learnt through rote learning. Importantly, students that use the keyword method to learn vocabulary also report that they enjoy it as a method more than previous methods used and that it is a more interesting method to use which keeps them motivated for longer (Kasper, 1982).

Explanations for the success of the keyword method have been based on Paivio’s dual coding theory (1986). This proposed that in addition to the verbal code of the word, the image provides a second independent code, meaning that retrieval is more likely as the learner now has two independent memory codes for the event, increasing the likelihood of the word being recalled than if just the verbal code was available (Thomas & Wang, 1996).

3

Others have suggested that rather than completely dropping the language requirement, dyslexic pupils should be allowed to study less. Downey & Schneider (1999) found that American college students who had dyslexia performed at a similar level to non-dyslexic students when they were allowed to learn reduced content. Whilst not as negative a statement as others, practically this would mean that although dyslexics are succeeding at what they are studying, they are not studying to a high enough level to be of future use.

However, McColl (1997) suggested that for dyslexic children, success at foreign languages depended not only on the child's skills but also on the school and its teaching strategies. She proposed that when suitable strategies were used, these children could benefit and show an improvement in their performance. In line with this idea, several interventions have been tried to help dyslexic children perform at a higher level in languages, some with more successful results than others.

One such strategy that has been highlighted to help dyslexic children is that of highly structured multisensory programmes. Programmes such as the "Hickey approach to language training" encourage learning through simultaneous activity of auditory, visual, tactile and kinaesthetic pathways. This is thought to be particularly beneficial to dyslexic children (Ott, 1997). Another such technique named the "Orton - Gillingham" method also simultaneously combines visual, auditory and kinaesthetic factors. An adaptation of the method for teaching Spanish had shown improved performance for children with dyslexia (Sparks, Ganschow, Pohlman, Artzer & Skinner, 1992).

It has also been suggested by several authors in the literature that dyslexic children may benefit from using mnemonic devices to learn foreign languages. Schneider et al (2000) suggest that non-verbal mnemonic devices, such as colour and shape, could be used to help dyslexic children remember gender or parts of speech. Another similar idea involves kinaesthetic reinforcement whereby the learner associates the meaning of parts of speech, such as suffixes with certain body movement. The authors give the example of associating the prefix "con" which means together with shaking hands. King Sears, Mercer & Sindelar (2002) found that children with learning difficulties benefited from using the key word method to learn science vocabulary. These students also reported higher enjoyment than the control subjects.

One suggestion, which may explain some of this improvement in children with dyslexia when using mnemonic strategies, is based on hemispheric specialisation. Mnemonic strategies have been suggested to be a "right brained skill" which is interesting as West (1997) notes that dyslexic children are often extremely good at activities that are seen as "right brained skills" such as creativity and visual learning. Traditional teaching methods however are focused on skills such as ability to categorise and retain facts, which are predominantly seen to be "left brained skills". Encouraging the use of mnemonic devices in dyslexic children therefore gives them an advantage in an area where they generally fall behind everyone else.

Linkword and dyslexia

Linkword has already shown success in helping individuals who have experienced language learning difficulties in improving their ability (Gruneberg et al, 1994, Gruneberg et al, 1996). In theory, the Linkword programme also displays many possible advantageous points for teaching the child with dyslexia as well, providing solutions to many problems

4

One of the main concerns about the method is that the learner will always have to bring these images to mind when wanting to speak the foreign language, which would slow the speaker down. However, it was shown by Kasper (1993) that with practice the learner automatically associates the two words together and the images drop out leaving just the translation in memory. The image is only used during the initial translations and as the link becomes more fluent, the image is no longer needed and is discarded (Kasper, 1993).

Linkword Languages Programme

If this technique has been shown to improve vocabulary learning to such a successful level, over and above that of traditional rote learning, then surely pupils would benefit from using this method in the classroom to learn essential word lists? One way in that this could be incorporated is through the computer-based programme "Linkword languages" (Gruneberg, 2002). Based on the above key word method, Linkword is a CD ROM programme that guides the learner through both vocabulary and grammar of a foreign language, providing the instructions and images needed for the learner to independently learn a set of vocabulary items for a given language. Each CD ROM covers an extensive set of common and useful vocabulary items, providing firstly the foreign word and its English translation and then the image combining the two as described above in the key word method. Learners are asked to envisage this image in their minds eye for at least ten seconds, before moving on. Sound is also available through speakers or headphones so that the learner can hear the pronunciation of the word, but this is optional and can be switched off if preferred. After running through a series of about ten words, a simple vocabulary test is given asking for both English and foreign language translations of the words just studied. Feedback is then provided through the form of the correct answer alongside the correct translation with another chance for correct pronunciation of the word to be heard if desired through clicking on the correct word. The learner then moves onto the next set of words to be learnt. Simple grammar is also taught on the CDROM, such as the gender of words. For example in French, learners are asked to imagine a bottle of perfume interacting with the word for a feminine word and a boxer for a masculine word.

The success of this simple method for vocabulary learning has been great, with increased recall of items being shown for many different groups and in many different situations. For example, the Linkword Spanish course was used by five Thompson Holiday executives keen to learn the language. After around twelve hours, the executives had knowledge of around 400 words and a basic grammar. It was estimated that to learn this information in a traditional manner it would take about 40 hours rather than the twelve taken. Factors such as motivation were also increased (Gruneberg 1987). This success was not a one off. Students participating in a voluntary weekend course to learn Spanish using the method all covered more than five hundred words in two and a half days, with recall of the words being an average of 84.7 for productive learning translating English words to their Spanish equivalent (Gruneberg, undated).

Attitude towards the programme has also been very positive. Thirteen volunteers from Humberside Polytechnic participated in a two-day course using the programme, learning a variety of languages. Responses to the method were very positive with many finding it a faster method to learn vocabulary and grammar, interesting, and a more positive technique than other methods previously used in school (Gruneberg, 1987). Similarly, Gruneberg & Sykes (1991) presented a first year practical class with level one of the Greek programme to learn. On average the students reported very positive attitudes to the method, describing

the programme as easier, faster and more enjoyable to traditional methods they had experienced in school.

The effect of linkword also appears to have long-term significance. Beaton, Gruneberg & Ellis (1995) described an individual who initially learnt Italian through the linkword method, picking up about 400 words and grammar. Ten years later the individual decided that as he was visiting Italy he would like to see what vocabulary he still knew. On testing, ten years after his initial learning, the individual recalled about 35% of the words. However, after looking over the glossary list of all the words he had previously learnt ten years ago for approximately ten minutes, he was retested and performed at 65%. This improved to a near perfect recall after further study of the words for about one and a half hours. This effect was seen to last for at least one month suggesting that vocabulary learned through linkword is long term (Beaton, Gruneberg & Ellis, 1995).

Linkword has also been shown to have positive results with individuals who may have difficulties with learning foreign languages for a variety of different reasons. For example, Gruneberg, Sykes & Gillett (1994) used images from the linkword programme with a group of learning disabled adults who showed poor language ability. Recall was significantly high for the group using this technique, compared to the control group who were simply told the translations of the words. Gruneberg & Pascoe (1996) also showed that using key word images from the linkword course lead to increased recall for both productive and receptive learning in the elderly, who as a group are often shown to have memory problems.

Although originally developed as a course designed to provide learners with a basic vocabulary to use in situations such as going abroad, Linkword has also already shown to have practical success in classrooms situations with pupils learning languages as part of the national curriculum. Although not many studies have been performed due to the practical and methodological problems of gaining significant access to schools and the problems of organising and sufficiently controlling any experiment in such an environment, those that have been completed have provided encouraging results.

One such success was seen by Gruneberg & Jacobs (1991) who reported significant results in a class of twelve and thirteen year olds in the B stream at Bishop Vaughn, a Swansea comprehensive school. The pupils used linkword in their Spanish class once a week whereas other classes did not use the programme and continued with their normal lessons. End of term vocabulary tests showed that those in the linkword class performed at an average level of 69% compared to an average score of only 24% in the other class, suggesting significant differences in success for the two groups.

Success was also seen in a group of thirteen-year-old children who were in the weakest set for French at Rugby school (Sommer & Gruneberg, 2002). All children had performed at less than 50% in their entrance exam to the school and had been targeted as having not only performance difficulties in French but also difficulties with regards to motivation and enjoyment of foreign languages. After initial instruction in linkword during class time, the pupils used linkword, at their own pace, once or twice a week as preparation for classes. The results yielded positive conclusions on two levels. Firstly, performance was seen to increase. Although no actual vocabulary test of linkword was given, performance in the end of year examinations was compared to the previous year where linkword was not used. The average mark for the class using linkword was 50% compared to 38% the year before.

6

There had been no significant difference in common entrance exam marks between the two years suggesting that the class who had used linkword reached a higher level. Secondly, and just as importantly, measures of attitude towards the programme, assessed through questionnaires, showed positive reactions towards the linkword programme and significant increases in motivation and enjoyment of foreign language learning. With regard to speed and ease of learning and enjoyment of the course, not one pupil responded negatively, with 58% responding positively to these factors. The school is still using the programme as part of its foreign language teaching.

These experiments are influential from an educational perspective as they show the practical success of Linkword as a programme out of the controlled environment of the laboratory. They show that Linkword can successfully be used in real life classroom situations to increase recall and enjoyment of foreign languages. As a strategy for learning, this programme has so far suggested that it could be used to help meet these new standards set by the government to improve both performance and motivation in pupils.

Dyslexic Pupils

At present, the National curriculum is very keen on the idea of "languages for all" (Grenfell, 2000). However, some pupils have been identified who struggle with languages to a far greater extent than the general problems seen by many children. One group of individuals who have been seen to display problems in learning foreign languages are dyslexic pupils. Crombie (1997) described how children with dyslexia show poorer performance, finding the subject difficult. Supporting this, Downey, Snyder & Hill (2000) showed that dyslexic children performed significantly poorer than controls on foreign language aptitude measures, phonological tasks, reading and spelling.

Similar reasons that lead dyslexic children to have problems mastering reading and writing in their own first language are thought to prevent a dyslexic child from successfully mastering a second or third language. Skehan (1986) suggests that a direct relationship between ability to learning of the native language and a second language exists as they are based on the same underlying skills. These skills, which dyslexics are documented to show particular weaknesses in are, amongst others, problems with phonological processing, poor working memory, poor auditory discrimination, faulty auditory sequencing, poor organisational skills, slow speed of information processing and limited attention span. (Crombie, 2000). Poor phonological skills, such as difficulty segmenting words into phonemes or morphemes lead to the child being unable to separate language into meaningful units (Pollock & Walker, 1994). This is especially evident in the two most common languages taught in school, which are French and German. Adams (1990) also notes that dyslexic children can have problems blending and synthesising phonemes into words, leading to problems with pronunciation and automaticity. These difficulties are described in Sparks & Ganschow's (1989) linguistic coding deficit hypothesis, which is based on empirical evidence of Vellutino & Scanlon (1986). The theory links these deficits to language difficulties through proposing that those with reading difficulties have problems with phonological, orthographical and syntactic elements of language – the elements making up the phonological "code" of the language. They do not however experience problems with the semantic aspects of the language.

Other deficits such as poor working memory also mean that the child has problems retaining vocabulary and accessing words, even in their native language (Crombie, 1995).

As the child also processes information at a slower level, this means that they fall behind in lessons as they find it hard to keep up with the pace of the lessons. The child misses half the information as they are still processing the first few words (Miles, 1993).

As emphasis today in schools is placed on the “natural” method of language teaching, with learners expected to learn through verbal exposure of the language. Learning, is predominantly speech based with instructions being given in the foreign language and communication in lessons encouraged to be in this language too. This emphasis is encouraged as the child is thought to learn through modelling speech patterns (Ganschow & Sparks, 2000). For the dyslexic child however, this emphasis only exacerbates their phonological deficits. Children with dyslexia need the emphasis to be of a more multisensory nature (Schneider & Ganschow, 2000). On top of these physical difficulties, students with learning difficulties are often seen to be anxious, unmotivated and lacking in self esteem towards their ability to learn languages which leads to poor enjoyment and poor motivation (Ganschow & Sparks, 2000).

Pressley, Johnson & Symons (1987) also suggest that children with dyslexia meet increased difficulties due to deficiencies in two areas. Firstly, students with learning disabilities are seen to have a poorer knowledge base and secondly they do not appear to use strategies in the same way as average students do. Their ability to encode and store information is therefore reduced. As a result, their knowledge cannot be enhanced in the same way by strategy use as occurs with learners with a larger knowledge base and the use of strategies. Mastropiere, Scruggs & Fulk (1990) note that these children become susceptible to the Matthew effect as the “less students with learning difficulties learn due to encoding and storage deficits, the less they are able to learn as they have an impoverished knowledge base”. Development of methods to help these children improve in language proficiency is therefore important to stop them falling further and further behind attainment targets.

Even though the importance of language learning has been highlighted, and educators are generally keen to raise standards in foreign language learning, many educators in response to this realisation of the difficulties faced by students with learning difficulties such as dyslexia are suggesting that the compulsory element of foreign language learning should be waived for these students, with either a reduced attainment target or the option of not studying a language at all. Ganschow, Myer & Roeger (1989) note that many colleges in the US, who often have a foreign language requirement in the first year, are now allowing students with learning difficulties to drop their language requirement. Miller & Bussman – Gillis (2000) also report that many researchers now think that the child with dyslexia should be allowed to drop foreign language lessons. Levine (1987) agrees, suggesting that forcing those with learning difficulties who have displayed problems trying to learn the language leads to anxiety, is a waste of time and can have adverse effects on other subjects studied. Even the Department for Educational Standards (2002) suggested that we no longer “force” children who find languages difficult to study such subjects at GCSE, providing the option of “disapplication”. Similarly, although a circular by the Scottish education Department (1989) stated that there “should be no automatic assumption that pupils with special needs should be excluded” from foreign language lessons, the circular expressed considerable doubt to the success of teaching children with dyslexia modern foreign languages (Crombie & McColl, 2000)

9

faced by dyslexic children in foreign language learning. Evidence has also been presented that dyslexic students may perform at least as well as non-dyslexic students when using the method (Maybury, 2002). The possible benefits of the programme to dyslexic children are plenty. Firstly, it does not purely rely on phonological methods of teaching that are often very common in the classroom – it integrates visual and semantic methods as well. As classroom methods are based upon listening and conversing as ways of learning the dyslexic child who is lacking in phonological skills, finds traditional methods difficult, if not impossible. With linkword, the dyslexic does not have to purely rely on phonological skill to the same extent, but can concentrate on the visual and semantic aspects of the programme. The sound can also be turned off if it is only serving as a distracter, which may be true if the child has severe phonological problems, or can be left on to help the child learn the links between the visual and the phonological aspect of the word.

Also, as a programme linkword is a multisensory presentation, targeting many aspects of language learning at once which cannot often be organised in a classroom situation. The dyslexic is therefore provided with supporting information in many different forms at once, which may provide extra reinforcement for each word learnt. Sparks et al (1991) note that greatest success is often seen for a dyslexic child when learning targets hearing, saying, seeing and writing especially when these interact simultaneously, which linkword provides the opportunity to do.

Secondly, Linkword is a very visual programme. The learner creates a visual picture in their mind's eye when learning a word and also sees the word on the screen in front of them as they learn it. Although dyslexics have been seen to have poor verbal short-term memory, their visual memory is usually normal (Hulme, 1981) and therefore they should not be at such a disadvantage to other children when using this programme compared to a normal phonologically based lesson. This aptitude for visualisation and pictorial representations is linked to their right-brained style of thinking (Vitale, 1982). Hornsby & Sheer (1982) suggest that visual images should be incorporated into vocabulary teaching whenever possible to act upon this strength. Crombie (2000) also notes that the dyslexic child often benefits from seeing the written word or a picture involving the written word as it serves as a memory hook, when learning a foreign language just as they do in their first language. Linkword of course provides this visual link. In support of these ideas, Mavommati & Miles (2002) found that using a pictographic method with dyslexic children when teaching spelling of Greek words was more successful than traditional spelling methods. The visual nature of the pictures appealed to their visual strengths rather than relying on phonological skills. Also, linkword makes use of semantic learning. Sparks & Ganschow (1993) showed that students with foreign language learning difficulties performed at the same level as students without difficulties for both visual and semantic memory tasks.

Another strength of the programme for teaching dyslexic children is its use of associations. Vitale (1982) noted that due to their superior ability for right-brained activities, dyslexic children often show aptitude for making associations and links between items, a skill that helps them when forming the interactive images required on the programme. Jameson (2000) emphasises this ability suggesting that the keyword method could be used by dyslexic children to link English words to their foreign equivalent. However, no empirical study was performed.

Fourthly, Myer & Ganschow (1998) note that as the dyslexic suffers from problems with speed of information processing, learning should be slowed down to accommodate for this. Dyslexic children may often feel embarrassed about being slower than other children in the class, which leads them feeling pressure to keep up with the speed of the lesson (Riddick, 2000). Also, if they are asked to provide answers out loud in class, they are publicly seen to be poorer at languages than their peers, with many actually reporting bullying due to this lack of ability (Riddick, 1996). Slowing the lesson down for the dyslexic child is often impossible in a classroom situation, but one of the benefits of linkword is that the pupil can go at their own pace allowing them to more fully understand what they are learning. The computer can repeat a word as many times as the child wants unlike a teacher who has time constraints (Bourne, 1996). Also as linkword is usually presented on an individual computer no other child is explicitly aware of the speed at which the child is progressing, therefore removing this potential source of embarrassment for the child.

Answers are also typed instead of written which removes the problem of illegible handwriting often seen in dyslexic children due to poor motor skills. Answers are also provided regularly giving continuous update on the child's progress. Also most children enjoy working on computers, as they are novel compared to normal lessons and often do not seem like proper work, again increasing enjoyment and motivation. Good phonological skills are not needed to work a computer and therefore the dyslexic child may feel on a more equal level with his or her peers when using one. The combination of the above factors may lead to the child feeling more confident in themselves and their ability to learn foreign languages. A method of learning that increases self-esteem is especially important for the dyslexic child as Riddick (1996) showed that children with dyslexia felt embarrassed, frustrated and low in confidence due to their difficulties.

A final interesting point is that of the actual visual presentation of linkword. Some dyslexic children present visual problems with the contrast of words against background, especially with small black text on a white background. Some children with dyslexia perceive a glare from white paper, which leads to problems physically reading the text (Jameson, 2000). Interventions such as tinted lenses or overlays have been introduced to try and remove this problem, with some success being seen. Wilkins (1996) noted that for some dyslexic children, using tinted lenses leads to letters being clearer and easier to read on the page. Although not all dyslexics suffer from this problem and not all of those who suffer from the problem are helped by these lenses, a sub group does exist for whom these lenses are a great help (Wilkins, 1996). The presentation of linkword is of yellow letters on a black background and therefore this problem of glare is removed for the learner who is sensitive to it. Also, Jameson (2000) notes that often in traditional textbooks, the presentation on the pages is very cluttered and overcrowded with the actual information being lost amongst the presentation. It is suggested that the critical information should appear centrally and simply on an uncluttered and clear page. The presentation of linkword adheres to this.

The child with dyslexia often starts to feel very anxious at the thought of language lessons, which has been shown to be very detrimental not just towards attitude but performance as well (Horwitz, Horwitz & Cope, 1986). Horwitz et al (1986) showed that this anxiety can be linked to a poorer self-concept, with Edwards (1994) supporting this idea, noting that children with dyslexia often report being low in confidence and doubt their ability to succeed. Linkword however incorporates many factors that may have the potential to make learning a language not only easier, but also less stressful, which could lead to increased motivation, confidence and enjoyment of languages, which are integral parts of the

Linkword Languages in the classroom – success for children with dyslexia in learning French

Amy Brown

Dept of Public Health Policy and Social Sciences

Swansea University

SUMMARY OF MAIN RESULTS

1. A TEST OF KNOWLEDGE OF FRENCH VOCABULARY PRIOR TO THE STUDY FOUND THE NON DYSLEXIC GROUP WERE SIGNIFICANTLY BETTER THAN THE DYSLEXIC GROUP
2. AFTER TRAINING WITH LINKWORD THERE WAS NO DIFFERENCE BETWEEN THE TWO GROUPS IN PERFORMANCE. BOTH GROUPS INCREASED THEIR VOCABULARY SIGNIFICANTLY
3. HOWEVER THE DYSLEXIC GROUP IMPROVED ITS PERFORMANCE SIGNIFICANTLY MORE THAN THE NON DYSLEXIC GROUP AS A RESULT OF USING LINKWORD
4. BOTH GROUPS IMPROVED FOR BOTH RECEPTIVE AND PRODUCTIVE LEARNING
5. THE DYSLEXIC GROUP REPORTED SIGNIFICANTLY INCREASED ENJOYMENT AS A RESULT OF USING LINKWORD
6. BOTH GROUPS REPORTED LEARNING VOCABULARY AND GRAMMAR SIGNIFICANTLY EASIER WITH LINKWORD

“Linkword Languages” in the classroom – success for children with dyslexia in learning French

In the United Kingdom today, learning a foreign language is becoming an increasingly important skill as more and more opportunities open up for British job seekers in the European Market (Crombie, 2000). A good grasp of a modern foreign language is now not merely another qualification at GCSE or A level but a key opportunity for career expansion once school has been long forgotten. For example, speaking in the “Times Educational Supplement” (November, 2002) Digby Jones, the director general of the confederation of British Industry, stated that without a foreign languages qualification young people are less able to compete in global organisations or companies. Similarly in the same issue, Ian Mullen, chief executive of the British bankers association declared that, “We need a work force with expanding language skills as eighty percent of regulations governing the UK financial industry originate from Brussels”. Learning a foreign language is therefore not only a compulsory element of the national curriculum at present for children up to the age of sixteen (McColl, 2000), but also an important qualification for life.

Enhanced employability is not the only benefit of learning a foreign language. Atkinson (1992) suggests that the pupil benefits from a whole range of skills and knowledge through these lessons. For example, from a social viewpoint, they learn more about different cultures, have more opportunities for travel and European identity is fostered. Benefits are also seen from a cognitive developmental viewpoint. Cognitive learning is seen to improve, the pupil learns more about his or her own language structure and concentration is thought to increase.

Participation and success at language learning is therefore extremely beneficial to the child on educational, vocational and interpersonal levels. However, pupils are not necessarily meeting these targets. Dobson (1998) highlights concerns revealed in inspection reports by the HMI over pupil’s abilities in languages after five years of teaching. Pupils are also failing to learn languages to a high enough level. For example, Curtis (2002) reported that only 2.85% of all British pupils qualified in A level French in 2000 and an even lower percentage of 1.1% qualified in German. Stables & Wilkeley (1999) also found that when asked to rate subjects on how much they liked them, languages were paced at the bottom of the list by thirteen and fourteen year olds. Compared to children of the same age in European countries, British students are also lagging behind. Speaking more than one language is common there but not in Britain (McColl, 2000). All of this evidence suggests that despite the importance of languages as a skill for life, the majority of pupils are not gaining high enough competence in them to benefit from these opportunities.

The question of how to raise the number of pupils studying languages is central to present modern foreign language debate. The purpose, methodology and curriculum content have all been recently debated by The Nuffield Inquiry report (Moys, 1998), which expressed anxiety over the situation at present. It is now being recognised that older, traditional methods should not necessarily be discarded but complemented with newer ideas and strategies for increasing not only performance but motivation as well (Grenfell 1993).

Key – Word Method

One suggestion to how performance in foreign languages could be increased is that more learning strategies should be incorporated into teaching, (Nunan, 1995). Away from education, one such group of strategies that have shown to increase and aid encoding and recall of information in general is that of the numerous mnemonic strategies. These strategies, which are often visually based, have been used to increase recall of a number of objects such as faces, lists of items and positions of chess pieces (Eysenck & Keane, 2000). One such strategy that has been widely and practically used and has shown success in increasing recall is based on foreign language learning. Known as the key word method, it involves relating an English word to another English word that sounds like the foreign translation, through the use of imagery (Gruneberg, 1998). For example, the French for Hedgehog is “Herrisson” which sounds like the English phrase “Hairy son”. Therefore the learner visualizes an image that involves a hedgehog and a their “hairy son” interacting, such as a their son playing with a hedgehog. Therefore when the learner next hears the French word “Herrisson” they picture a “hairy son” in their minds eye and retrieve an image of the Hedgehog, as the two have become linked in memory. Similarly when translating the word Hedgehog into French, the learner again imagines this image of the Hedgehog and retrieves the phrase “Hairy son” from memory, which prompts the translated word “Herrisson”. Therefore an acoustic link connects the familiar key word to the unfamiliar word to be learned through the similarity of the sound of the two words. Imagery then links an interactive picture of the unfamiliar word with the familiar word (King – Sears, Mercer & Sindelar, 2002). Associations between the keyword and the translation are therefore strengthened whilst associations between the translations and other English words are reduced (Kaspar, 1993)

Recall has been shown to increase using this method of language learning in comparison to methods such as straightforward rote learning by many researchers. For example, Atkinson & Raugh (1975) presented participants with forty Russian words a day for three days. Half the subjects were given information on the key word method to learn the words and the other half acted as a control group and did not received any information. A vocabulary test was then given, with the key word group recalling on average 72% of the words compared to an average score of 46% for the control group. The participants were then told the experiment had finished but six weeks later were called back for another test. This time the key word group recalled 43% of the words compared to 28% correctly answered by the control group. Differences in scores between the key word and control groups were at both times highly significant suggesting that the key word methods played a crucial part in boosting recall for the vocabulary (Atkinson, 1975). Hogben & Lawson (1994) also supported this finding through using the method with students learning Italian. Recall for words learnt using the keyword method was significantly higher than words learnt through rote learning. Importantly, students that use the keyword method to learn vocabulary also report that they enjoy it as a method more than previous methods used and that it is a more interesting method to use which keeps them motivated for longer (Kasper, 1982).

Explanations for the success of the keyword method have been based on Paivio’s dual coding theory (1986). This proposed that in addition to the verbal code of the word, the image provides a second independent code, meaning that retrieval is more likely as the learner now has two independent memory codes for the event, increasing the likelihood of the word being recalled than if just the verbal code was available (Thomas & Wang, 1996).

3

Others have suggested that rather than completely dropping the language requirement, dyslexic pupils should be allowed to study less. Downey & Schneider (1999) found that American college students who had dyslexia performed at a similar level to non-dyslexic students when they were allowed to learn reduced content. Whilst not as negative a statement as others, practically this would mean that although dyslexics are succeeding at what they are studying, they are not studying to a high enough level to be of future use.

However, McColl (1997) suggested that for dyslexic children, success at foreign languages depended not only on the child's skills but also on the school and its teaching strategies. She proposed that when suitable strategies were used, these children could benefit and show an improvement in their performance. In line with this idea, several interventions have been tried to help dyslexic children perform at a higher level in languages, some with more successful results than others.

One such strategy that has been highlighted to help dyslexic children is that of highly structured multisensory programmes. Programmes such as the "Hickey approach to language training" encourage learning through simultaneous activity of auditory, visual, tactile and kinaesthetic pathways. This is thought to be particularly beneficial to dyslexic children (Ott, 1997). Another such technique named the "Orton – Gillingham" method also simultaneously combines visual, auditory and kinaesthetic factors. An adaptation of the method for teaching Spanish had shown improved performance for children with dyslexia (Sparks, Ganschow, Pohlman, Artzer & Skinner, 1992).

It has also been suggested by several authors in the literature that dyslexic children may benefit from using mnemonic devices to learn foreign languages. Schneider et al (2000) suggest that non-verbal mnemonic devices, such as colour and shape, could be used to help dyslexic children remember gender or parts of speech. Another similar idea involves kinaesthetic reinforcement whereby the learner associates the meaning of parts of speech, such as suffixes with certain body movement. The authors give the example of associating the prefix "con" which means together with shaking hands. King Sears, Mercer & Sindelar (2002) found that children with learning difficulties benefited from using the key word method to learn science vocabulary. These students also reported higher enjoyment than the control subjects.

One suggestion, which may explain some of this improvement in children with dyslexia when using mnemonic strategies, is based on hemispheric specialisation. Mnemonic strategies have been suggested to be a "right brained skill" which is interesting as West (1997) notes that dyslexic children are often extremely good at activities that are seen as "right brained skills" such as creativity and visual learning. Traditional teaching methods however are focused on skills such as ability to categorise and retain facts, which are predominantly seen to be "left brained skills". Encouraging the use of mnemonic devices in dyslexic children therefore gives them an advantage in an area where they generally fall behind everyone else.

Linkword and dyslexia

Linkword has already shown success in helping individuals who have experienced language learning difficulties in improving their ability (Gruneberg et al, 1994, Gruneberg et al, 1996). In theory, the Linkword programme also displays many possible advantageous points for teaching the child with dyslexia as well, providing solutions to many problems

4
One of the main concerns about the method is that the learner will always have to bring these images to mind when wanting to speak the foreign language, which would slow the speaker down. However, it was shown by Kasper (1993) that with practice the learner automatically associates the two words together and the images drop out leaving just the translation in memory. The image is only used during the initial translations and as the link becomes more fluent, the image is no longer needed and is discarded (Kasper, 1993).

Linkword Languages Programme

If this technique has been shown to improve vocabulary learning to such a successful level, over and above that of traditional rote learning, then surely pupils would benefit from using this method in the classroom to learn essential word lists? One way in that this could be incorporated is through the computer-based programme "Linkword languages" (Gruneberg, 2002). Based on the above key word method, Linkword is a CD ROM programme that guides the learner through both vocabulary and grammar of a foreign language, providing the instructions and images needed for the learner to independently learn a set of vocabulary items for a given language. Each CD ROM covers an extensive set of common and useful vocabulary items, providing firstly the foreign word and its English translation and then the image combining the two as described above in the key word method. Learners are asked to envisage this image in their minds eye for at least ten seconds, before moving on. Sound is also available through speakers or headphones so that the learner can hear the pronunciation of the word, but this is optional and can be switched off if preferred. After running through a series of about ten words, a simple vocabulary test is given asking for both English and foreign language translations of the words just studied. Feedback is then provided through the form of the correct answer alongside the correct translation with another chance for correct pronunciation of the word to be heard if desired through clicking on the correct word. The learner then moves onto the next set of words to be learnt. Simple grammar is also taught on the CDROM, such as the gender of words. For example in French, learners are asked to imagine a bottle of perfume interacting with the word for a feminine word and a boxer for a masculine word.

The success of this simple method for vocabulary learning has been great, with increased recall of items being shown for many different groups and in many different situations. For example, the Linkword Spanish course was used by five Thompson Holiday executives keen to learn the language. After around twelve hours, the executives had knowledge of around 400 words and a basic grammar. It was estimated that to learn this information in a traditional manner it would take about 40 hours rather than the twelve taken. Factors such as motivation were also increased (Gruneberg 1987). This success was not a one off. Students participating in a voluntary weekend course to learn Spanish using the method all covered more than five hundred words in two and a half days, with recall of the words being an average of 84.7 for productive learning translating English words to their Spanish equivalent (Gruneberg, undated).

Attitude towards the programme has also been very positive. Thirteen volunteers from Humberside Polytechnic participated in a two-day course using the programme, learning a variety of languages. Responses to the method were very positive with many finding it a faster method to learn vocabulary and grammar, interesting, and a more positive technique than other methods previously used in school (Gruneberg, 1987). Similarly, Gruneberg & Sykes (1991) presented a first year practical class with level one of the Greek programme to learn. On average the students reported very positive attitudes to the method, describing

the programme as easier, faster and more enjoyable to traditional methods they had experienced in school.

The effect of linkword also appears to have long-term significance. Beaton, Gruneberg & Ellis (1995) described an individual who initially learnt Italian through the linkword method, picking up about 400 words and grammar. Ten years later the individual decided that as he was visiting Italy he would like to see what vocabulary he still knew. On testing, ten years after his initial learning, the individual recalled about 35% of the words. However, after looking over the glossary list of all the words he had previously learnt ten years ago for approximately ten minutes, he was retested and preformed at 65%. This improved to a near perfect recall after further study of the words for about one and a half hours. This effect was seen to last for at least one month suggesting that vocabulary learned through linkword is long term (Beaton, Gruneberg & Ellis, 1995).

Linkword has also been shown to have positive results with individuals who may have difficulties with learning foreign languages for a variety of different reasons. For example, Gruneberg, Sykes & Gillett (1994) used images from the linkword programme with a group of learning disabled adults who showed poor language ability. Recall was significantly high for the group using this technique, compared to the control group who were simply told the translations of the words. Gruneberg & Pascoe (1996) also showed that using key word images from the linkword course lead to increased recall for both productive and receptive learning in the elderly, who as a group are often shown to have memory problems.

Although originally developed as a course designed to provide learners with a basic vocabulary to use in situations such as going abroad, Linkword has also already shown to have practical success in classrooms situations with pupils learning languages as part of the national curriculum. Although not many studies have been performed due to the practical and methodological problems of gaining significant access to schools and the problems of organising and sufficiently controlling any experiment in such an environment, those that have been completed have provided encouraging results.

One such success was seen by Gruneberg & Jacobs (1991) who reported significant results in a class of twelve and thirteen year olds in the B stream at Bishop Vaughn, a Swansea comprehensive school. The pupils used linkword in their Spanish class once a week whereas other classes did not use the programme and continued with their normal lessons. End of term vocabulary tests showed that those in the linkword class performed at an average level of 69% compared to an average score of only 24% in the other class, suggesting significant differences in success for the two groups.

Success was also seen in a group of thirteen-year-old children who were in the weakest set for French at Rugby school (Sommer & Gruneberg, 2002). All children had performed at less than 50% in their entrance exam to the school and had been targeted as having not only performance difficulties in French but also difficulties with regards to motivation and enjoyment of foreign languages. After initial instruction in linkword during class time, the pupils used linkword, at their own pace, once or twice a week as preparation for classes. The results yielded positive conclusions on two levels. Firstly, performance was seen to increase. Although no actual vocabulary test of linkword was given, performance in the end of year examinations was compared to the previous year where linkword was not used. The average mark for the class using linkword was 50% compared to 38% the year before.

6

There had been no significant difference in common entrance exam marks between the two years suggesting that the class who had used linkword reached a higher level. Secondly, and just as importantly, measures of attitude towards the programme, assessed through questionnaires, showed positive reactions towards the linkword programme and significant increases in motivation and enjoyment of foreign language learning. With regard to speed and ease of learning and enjoyment of the course, not one pupil responded negatively, with 58% responding positively to these factors. The school is still using the programme as part of its foreign language teaching.

These experiments are influential from an educational perspective as they show the practical success of Linkword as a programme out of the controlled environment of the laboratory. They show that Linkword can successfully be used in real life classroom situations to increase recall and enjoyment of foreign languages. As a strategy for learning, this programme has so far suggested that it could be used to help meet these new standards set by the government to improve both performance and motivation in pupils.

Dyslexic Pupils

At present, the National curriculum is very keen on the idea of “languages for all” (Grenfell, 2000). However, some pupils have been identified who struggle with languages to a far greater extent than the general problems seen by many children. One group of individuals who have been seen to display problems in learning foreign languages are dyslexic pupils. Crombie (1997) described how children with dyslexia show poorer performance, finding the subject difficult. Supporting this, Downey, Snyder & Hill (2000) showed that dyslexic children performed significantly poorer than controls on foreign language aptitude measures, phonological tasks, reading and spelling.

Similar reasons that lead dyslexic children to have problems mastering reading and writing in their own first language are thought to prevent a dyslexic child from successfully mastering a second or third language. Skehan (1986) suggests that a direct relationship between ability to learning of the native language and a second language exists as they are based on the same underlying skills. These skills, which dyslexics are documented to show particular weaknesses in are, amongst others, problems with phonological processing, poor working memory, poor auditory discrimination, faulty auditory sequencing, poor organisational skills, slow speed of information processing and limited attention span (Crombie, 2000). Poor phonological skills, such as difficulty segmenting words into phonemes or morphemes lead to the child being unable to separate language into meaningful units (Pollock & Walker, 1994). This is especially evident in the two most common languages taught in school, which are French and German. Adams (1990) also notes that dyslexic children can have problems blending and synthesising phonemes into words, leading to problems with pronunciation and automaticity. These difficulties are described in Sparks & Ganschow’s (1989) linguistic coding deficit hypothesis, which is based on empirical evidence of Vellutino & Scanlon (1986). The theory links these deficits to language difficulties through proposing that those with reading difficulties have problems with phonological, orthographical and syntactic elements of language – the elements making up the phonological “code” of the language. They do not however experience problems with the semantic aspects of the language.

Other deficits such as poor working memory also mean that the child has problems retaining vocabulary and accessing words, even in their native language (Crombie, 1995).

As the child also processes information at a slower level, this means that they fall behind in lessons as they find it hard to keep up with the pace of the lessons. The child misses half the information as they are still processing the first few words (Miles, 1993).

As emphasis today in schools is placed on the “natural” method of language teaching, with learners expected to learn through verbal exposure of the language. Learning, is predominantly speech based with instructions being given in the foreign language and communication in lessons encouraged to be in this language too. This emphasis is encouraged as the child is thought to learn through modelling speech patterns (Ganschow & Sparks, 2000). For the dyslexic child however, this emphasis only exacerbates their phonological deficits. Children with dyslexia need the emphasis to be of a more multisensory nature (Schneider & Ganschow, 2000). On top of these physical difficulties, students with learning difficulties are often seen to be anxious, unmotivated and lacking in self esteem towards their ability to learn languages which leads to poor enjoyment and poor motivation (Ganschow & Sparks, 2000).

Pressley, Johnson & Symons (1987) also suggest that children with dyslexia meet increased difficulties due to deficiencies in two areas. Firstly, students with learning disabilities are seen to have a poorer knowledge base and secondly they do not appear to use strategies in the same way as average students do. Their ability to encode and store information is therefore reduced. As a result, their knowledge cannot be enhanced in the same way by strategy use as occurs with learners with a larger knowledge base and the use of strategies. Mastropiere, Scruggs & Fulk (1990) note that these children become susceptible to the Matthew effect as the “less students with learning difficulties learn due to encoding and storage deficits, the less they are able to learn as they have an impoverished knowledge base”. Development of methods to help these children improve in language proficiency is therefore important to stop them falling further and further behind attainment targets.

Even though the importance of language learning has been highlighted, and educators are generally keen to raise standards in foreign language learning, many educators in response to this realisation of the difficulties faced by students with learning difficulties such as dyslexia are suggesting that the compulsory element of foreign language learning should be waived for these students, with either a reduced attainment target or the option of not studying a language at all. Ganschow, Myer & Roeger (1989) note that many colleges in the US, who often have a foreign language requirement in the first year, are now allowing students with learning difficulties to drop their language requirement. Miller & Bussman – Gillis (2000) also report that many researchers now think that the child with dyslexia should be allowed to drop foreign language lessons. Levine (1987) agrees, suggesting that forcing those with learning difficulties who have displayed problems trying to learn the language leads to anxiety, is a waste of time and can have adverse effects on other subjects studied. Even the Department for Educational Standards (2002) suggested that we no longer “force” children who find languages difficult to study such subjects at GCSE, providing the option of “disapplication”. Similarly, although a circular by the Scottish education Department (1989) stated that there “should be no automatic assumption that pupils with special needs should be excluded” from foreign language lessons, the circular expressed considerable doubt to the success of teaching children with dyslexia modern foreign languages (Crombie & McColl, 2000)

9

faced by dyslexic children in foreign language learning. Evidence has also been presented that dyslexic students may perform at least as well as non-dyslexic students when using the method (Maybury, 2002). The possible benefits of the programme to dyslexic children are plenty. Firstly, it does not purely rely on phonological methods of teaching that are often very common in the classroom – it integrates visual and semantic methods as well. As classroom methods are based upon listening and conversing as ways of learning the dyslexic child who is lacking in phonological skills, finds traditional methods difficult, if not impossible. With linkword, the dyslexic does not have to purely rely on phonological skill to the same extent, but can concentrate on the visual and semantic aspects of the programme. The sound can also be turned off if it is only serving as a distracter, which may be true if the child has severe phonological problems, or can be left on to help the child learn the links between the visual and the phonological aspect of the word.

Also, as a programme linkword is a multisensory presentation, targeting many aspects of language learning at once which cannot often be organised in a classroom situation. The dyslexic is therefore provided with supporting information in many different forms at once, which may provide extra reinforcement for each word learnt. Sparks et al (1991) note that greatest success is often seen for a dyslexic child when learning targets hearing, saying, seeing and writing especially when these interact simultaneously, which linkword provides the opportunity to do.

Secondly, Linkword is a very visual programme. The learner creates a visual picture in their mind's eye when learning a word and also sees the word on the screen in front of them as they learn it. Although dyslexics have been seen to have poor verbal short-term memory, their visual memory is usually normal (Hulme, 1981) and therefore they should not be at such a disadvantage to other children when using this programme compared to a normal phonologically based lesson. This aptitude for visualisation and pictorial representations is linked to their right-brained style of thinking (Vitale, 1982). Hornsby & Sheer (1982) suggest that visual images should be incorporated into vocabulary teaching whenever possible to act upon this strength. Crombie (2000) also notes that the dyslexic child often benefits from seeing the written word or a picture involving the written word as it serves as a memory hook, when learning a foreign language just as they do in their first language. Linkword of course provides this visual link. In support of these ideas, Mavommati & Miles (2002) found that using a pictographic method with dyslexic children when teaching spelling of Greek words was more successful than traditional spelling methods. The visual nature of the pictures appealed to their visual strengths rather than relying on phonological skills. Also, linkword makes use of semantic learning. Sparks & Ganschow (1993) showed that students with foreign language learning difficulties performed at the same level as students without difficulties for both visual and semantic memory tasks.

Another strength of the programme for teaching dyslexic children is its use of associations. Vitale (1982) noted that due to their superior ability for right-brained activities, dyslexic children often show aptitude for making associations and links between items, a skill that helps them when forming the interactive images required on the programme. Jameson (2000) emphasises this ability suggesting that the keyword method could be used by dyslexic children to link English words to their foreign equivalent. However, no empirical study was performed.

Fourthly, Myer & Ganschow (1998) note that as the dyslexic suffers from problems with speed of information processing, learning should be slowed down to accommodate for this. Dyslexic children may often feel embarrassed about being slower than other children in the class, which leads them feeling pressure to keep up with the speed of the lesson (Riddick, 2000). Also, if they are asked to provide answers out loud in class, they are publicly seen to be poorer at languages than their peers, with many actually reporting bullying due to this lack of ability (Riddick, 1996). Slowing the lesson down for the dyslexic child is often impossible in a classroom situation, but one of the benefits of linkword is that the pupil can go at their own pace allowing them to more fully understand what they are learning. The computer can repeat a word as many times as the child wants unlike a teacher who has time constraints (Bourne, 1996). Also as linkword is usually presented on an individual computer no other child is explicitly aware of the speed at which the child is progressing, therefore removing this potential source of embarrassment for the child.

Answers are also typed instead of written which removes the problem of illegible handwriting often seen in dyslexic children due to poor motor skills. Answers are also provided regularly giving continuous update on the child's progress. Also most children enjoy working on computers, as they are novel compared to normal lessons and often do not seem like proper work, again increasing enjoyment and motivation. Good phonological skills are not needed to work a computer and therefore the dyslexic child may feel on a more equal level with his or her peers when using one. The combination of the above factors may lead to the child feeling more confident in themselves and their ability to learn foreign languages. A method of learning that increases self-esteem is especially important for the dyslexic child as Riddick (1996) showed that children with dyslexia felt embarrassed, frustrated and low in confidence due to their difficulties.

A final interesting point is that of the actual visual presentation of linkword. Some dyslexic children present visual problems with the contrast of words against background, especially with small black text on a white background. Some children with dyslexia perceive a glare from white paper, which leads to problems physically reading the text (Jameson, 2000). Interventions such as tinted lenses or overlays have been introduced to try and remove this problem, with some success being seen. Wilkins (1996) noted that for some dyslexic children, using tinted lenses leads to letters being clearer and easier to read on the page. Although not all dyslexics suffer from this problem and not all of those who suffer from the problem are helped by these lenses, a sub group does exist for whom these lenses are a great help (Wilkins, 1996). The presentation of linkword is of yellow letters on a black background and therefore this problem of glare is removed for the learner who is sensitive to it. Also, Jameson (2000) notes that often in traditional textbooks, the presentation on the pages is very cluttered and overcrowded with the actual information being lost amongst the presentation. It is suggested that the critical information should appear centrally and simply on an uncluttered and clear page. The presentation of linkword adheres to this.

The child with dyslexia often starts to feel very anxious at the thought of language lessons, which has been shown to be very detrimental not just towards attitude but performance as well (Horwitz, Horwitz & Cope, 1986). Horwitz et al (1986) showed that this anxiety can be linked to a poorer self-concept, with Edwards (1994) supporting this idea, noting that children with dyslexia often report being low in confidence and doubt their ability to succeed. Linkword however incorporates many factors that may have the potential to make learning a language not only easier, but also less stressful, which could lead to increased motivation, confidence and enjoyment of languages, which are integral parts of the

learning process. Motivation has been critically linked with actual performance in foreign languages, with students with the highest motivation showing the highest recall (Gardner 1972). The causality of this correlation could naturally be argued in either direction, but evidence by Ganschow et al (1989) suggests that initially, poor performance in a foreign language leads the child to become demotivated. This in turn affects their efforts and general attitudes, leading them to perform poorer still, and so the circle continues. Dyslexic children need a programme of teaching which helps them break free of this circle. As this lack of motivation is thought to be due to their performance in the language and not an attitude that they initially brought to language learning, a programme that helps the child improve with regards to recall could also lead to a motivation shift.

As motivation and enjoyment of foreign languages appear to be at an all time low at present, not only in dyslexic children but also in the classroom generally, a programme that has the ability to improve this situation should be welcomed. Clearly, to promote positive attitudes toward language learning in our secondary schools new techniques need to be introduced for both pupils and educators sake. The benefits of linkword described above have the potential to not only increase participation in languages of dyslexic children as they remove many barriers, but serve to motivate all children as well.

Present aims

The aim of the present research was therefore multifaceted. The first was to test for support of the performance and attitudinal conclusions after using Linkword yielded by previous studies for those children without learning difficulties. It was predicted that these average readers would show high increased recall and positive attitudinal responses after using Linkword. Secondly, it was hypothesised that due to the nature of the linkword programme, dyslexic children would also show high increased recall and would also report positive attitudes. Thirdly, it was proposed that for attitudinal measures, significant differences might be found between the two groups, with dyslexic children showing significantly more positive responses than the average readers. This was predicted as the programme was expected to appeal to their deficits. Together, it is proposed that the results will show that Linkword will succeed in the classroom as a practical strategy for language learning for both average readers and dyslexic children. Pupil's general performance and attitudes towards language learning will increase using the programme.

The research hopes to challenge the developing view that dyslexic children should be given waivers or study to a lower level in their language classes. It hopes to provide a successful strategy for helping dyslexic pupil improve in their foreign language lessons and to also increase motivation of pupils in the foreign language classroom.

Finally, a small group of children diagnosed as poor readers but not dyslexic were also studied, although the group was not large enough to ensure reliable results. Poor readers display similar problems in language learning to dyslexic children, performing poorly due to comparable reasons such as impaired phonological ability. However, unlike dyslexic children, whose IQ is seen to be above average, their IQ is below average (Snowling, 2000). It was hypothesised that these children would also benefit from linkword, due to their similarities with dyslexic children, but that they would perform at a lower level than the dyslexic children due to their poorer IQ. However, performance would still be enhanced and attitudes towards the programme such as enjoyment and ease were also expected to be positive.

Method

Subjects

Sixty pupils, 39 male and 15 female at an unnamed school* participated in the study. The pupils were all in year nine with the mean age being 14.9, S.D = 0.29. The pupils were selected as they had chosen French as one of their foreign language options for that year and were in one of the four classes selected out of the seven classes in that year. The school selected these classes for the study due to reasons of availability and sufficient time to accommodate the two lessons needed. Each class was at a different ability level and therefore a range of previous ability and knowledge of French was represented across classes. All pupils who were present in each class for both lessons were used in the study. Any pupil not present for both lessons was discarded from the analysis.

The pupils were split into two main groups for the analysis. The first group, labelled as average readers, were those who had not been diagnosed with any specific or general learning difficulty and showed no reading difficulties. This group consisted of 39 pupils, 27 male and 12 female, mean age 14 years and nine months, S.D = 0.29. The second group were those who had been diagnosed with dyslexia by an educational psychologist. This group consisted of 15 pupils, 12 male and 3 female, and the mean age 14 years and 11 months, S.D.= 0.27. Information regarding the IQ and reading scores for both groups is available in appendix seven.

A third further group of six pupils were also studied, separately from the main analysis. These were the pupils from the classes who had been diagnosed as having reading difficulties but not dyslexia by an educational psychologist. The mean age of these children was, 14 years and 11 months, S.D. = 0.34, 1 of which was female and 5 male. As this group was so small it was felt not to be suitable to include them in the main analysis. Therefore they participated in exactly the same manner to the other two groups, but were treated as a separate group when the results were speculatively analysed. Again, information of IQ and reading scores is available in appendix seven.

* The school has asked specifically not to be named in order to protect confidentiality

Materials

Several materials were used. Firstly, level one of French linkword CDROM (Gruneberg 2002) was installed on the schools computer network. This was therefore available to each pupil who logged onto the network in one of the computer labs. For both the lessons each child had individual access to a computer in the lab. Headphones were provided for each computer but some of these did not work, meaning that a few pupils did not have the sound working.

The first two sections of the programme were used which were based on the subjects of animals, hotel, home, colours and some adjectives. These words and their translations were presented on the computer screen one at a time along with the suggested image to visualise. An acoustic form of the translation was also provided, which could be repeated by clicking on the target word. The next image was then presented when the pupil chose to, through clicking on "next". Approximately ten words were introduced at a time,

followed by an on screen test. Space was given for the pupil to type their answer in and once "next" was clicked on, the correct answer given. Feedback was then provided, giving the correct answers and answers given. The genders of these words were then introduced and also basic grammar so the target words could be incorporated into sentences. Approximately thirty words were used in each section.

A questionnaire was given to each pupil to be filled in before learning commenced (see appendix one). This consisted of eight questions designed to measure pupil's attitude towards languages before linkword was used, such as enjoyment and ease. Each question consisted of a question and a five point scale on which to answer, ranging from one to five, with one denoting a very positive attitude, three an ambivalent attitude and five a very negative attitude. A second questionnaire was also administered after learning (see appendix two). In the same style as the first questionnaire, this consisted of nine questions to measure pupil's attitudes towards linkword. Both the questionnaires had space for the pupils school number for identity purposes so that confidentiality was assured.

Each pupil also completed a two-sheet test paper. This consisted of fifty-six questions taken from sections one and two on the CDROM. Half the questions required English to French translations (productive learning) and half French to English translations (receptive learning) (See appendix three). As Linkwords ability to increase recall in both directions was being measured, these were alternated to allow for any effects of fatigue due to answering previous items. Written instructions on how to complete the test appeared at the top of each question appear along with space for pupil number to ensure confidentiality. A sheet with translations of the words covered was available for each pupil after the test was over (see appendix four)

Written instructions were given to a member of staff who started off each first lesson for the four sets in order to maintain the same conditions for each set and also so that all important information was conveyed (see appendix five). A further set of written instructions were given to the member of staff leading each set to follow through for the second lesson (see appendix six).

The school also provided data sheets with information about the pupil's gender, date of birth and whether they had been diagnosed with dyslexia or reading difficulties. Information was also provided with scores of tests of reading age, Hedderly scores which measure reading rate and performance IQ scores. These only appeared with the pupil's school number for identification, again to maintain confidentiality.

Procedure

Each of the four classes selected participated in two lessons, each one week after the other in the same timetable slot. These lessons were thirty-five minutes each but once pupils were settled, time available totalled at approximately one hour. The lessons took part in one of the schools language labs, which have sufficient computers for each pupil to have a separate machine, each pre - programmed with linkword.

Written instructions were given to a teacher (see appendix five) who led the beginning of each first lesson. Firstly, pupils were asked to fill in the first questionnaire answering as honestly as possible. They were then given a brief introduction to linkword explaining how to follow the CDROM and given some practice examples so they understood exactly

how the method worked. It was stressed that they must spend at least ten seconds on each image. Pupils were also told that the aim of the work was for a research project and that although a test would be given at the end, it was a test of Linkword and not a test that their class teacher would be using to assess them.

The pupils were then instructed to follow the programme for the remainder of the lesson, starting on section one and continuing to section two if they had time. Pupils were told to work on their own in order to make sure that they concentrated and that they were in no way helped by other members of the class. At the end of the lesson pupils noted at which point they had reached on the CD and left for their next lesson. The teacher was available for any questions to be answered but otherwise only observed the lesson after giving instructions.

Written instructions were given to each of the classroom teachers for them to follow in their next lesson (see appendix six). At the start of this lesson pupils were instructed by their class teachers to continue the programme from where they left off going no further than section two. They were reminded of key points such as imagining each image for ten seconds.

Fifteen minutes before the end of the lesson the teacher stopped the lesson and the computers were turned off. Pupils were given the sheet with a list of 56 vocabulary items taken from sections one and two that would be in the test. This sheet contained only the translations – it did not contain the images. The class teacher read through the list of words for the pupils. This served as a small revision session, similar to how a pupil may perform before a normal test of such kind. These sheets were then collected in and a test paper given. Pupils were told to answer as many questions as they could but not to worry if they were unable to answer some. They were also told to draw a line under the point on the test they had reached on the CDROM so that they were not tested on words that they did not know. Percentage scores based on the number of words covered on the programme were then used to calculate performance. For example, if a pupil only covered forty of the words on the programme, but got thirty of these correct, their score was seen to be 30/40 rather than 30/56. This enabled the pupils who work at a slower rate in class to be at a fair advantage as the quicker pupils.

The pupils were also asked to star the words on the sheet that they already knew before linkword as they completed the test. This was to act as a measure of vocabulary knowledge as learnt through lessons and experience with the French language before Linkword was used. Pupils were expected to have been exposed to a similar basic syllabus of vocabulary in their lessons, whether they had actually learnt the words or not and therefore this was taken in order to measure whether the dyslexics were performing at a lower level than the average readers in general in languages before learning through the Linkword programme. This method was used instead of a full test before Linkword, as time was very limited due to the nature of the study.

Two classes did not complete this instruction however. It was not realised until after the lesson that this had occurred and therefore it was decided the best method was to ask them to star the words on a separate test sheet that they knew before they had studied linkword. This was accepted to be a less accurate measure, but the best solution to the problem.

Results

Two main hypotheses were investigated. The first of these was to see whether an increase in recall would be seen for both “average” readers and dyslexics after using Linkword and if any differences would be seen in final recall scores of these two groups. The second investigation compared both groups’ attitudes to Linkword as a method of language learning, again looking to see if significant differences occurred between groups. Raw data is available in appendix seven, with spss output in appendix eight.

To investigate the effect of Linkword on recall, scores taken before and after Linkword were compared for both groups. Three analyses were performed comparing previous knowledge to recall after Linkword when hard, medium and soft criteria were used to mark the English to French translations. When hard criteria were used, responses were only accepted as correct if spelt correctly. With medium criteria, answers were accepted if spelt phonologically similar to the correct response. For soft criteria, the response was accepted if evidence of some knowledge of the correct response as seen.

Figure 1: Scores before and after training for “average” and dyslexic readers (based on hard criteria)

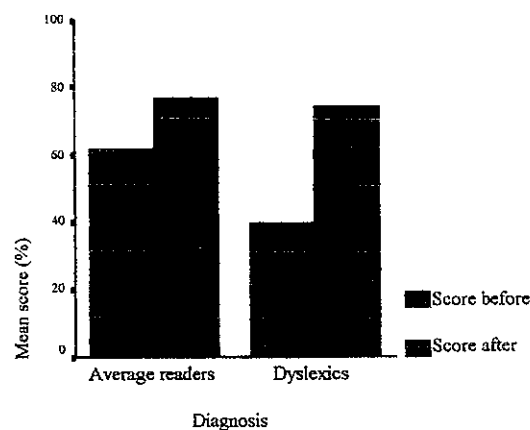


Figure one clearly shows that the dyslexic’s are generally performing at a lower level than the “average” readers before Linkword was used. However, scores are very similar for the two groups after Linkword had been used, with both groups showing an increase in recall. A repeated measures ANOVA was performed to compare this performance for “average” and dyslexic readers both before and after Linkword, using the scores based on hard criteria for the English to French translations. Answers were only accepted as correct if spelt correctly. Significant differences were found for scores before and scores after, $F(1,52) = 52.07$, $p < 0.01$, showing that scores after Linkword were significantly higher than scores before Linkword. A significant interaction was also found between time of test and diagnosis, $F(1,52) = 7.65$, $p < 0.01$. Simple main effects were used to analyse this further showing that a significant difference occurred between groups for scores before Linkword was used, F

(1,52) = 15.41, $p < 0.01$. No significant difference was found between the groups once Linkword was used, $F(1,52) = 0.21$, $P > 0.05$.

Using the comparison of means as shown in figure 1, this shows that dyslexics were performing significantly poorer than “average” readers before Linkword was used but after using Linkword, performance equalled for both reading ability groups. Both groups significantly improved from their scores before Linkword was used, with the dyslexics showing a significantly greater increase to match the “average” readers ability. Both groups showed a high final recall.

Figure 2: Scores before and after training for “average” and dyslexic readers (Comparing hard, medium and soft criteria)

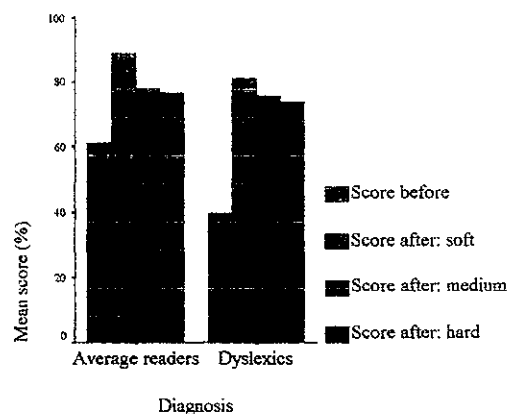


Figure 2 shows a comparison of scores before and after Linkword based on hard, medium and soft recall for both “average” readers and dyslexics. As the first analysis was based only on hard criteria, identical analyses of variance were carried out to examine the differences between groups before and after training when medium and soft scoring criteria were used. However, an analysis of variance could not be completed to see whether the hard, medium and soft recall scores were significantly different from each other as the scores were embedded within each other.

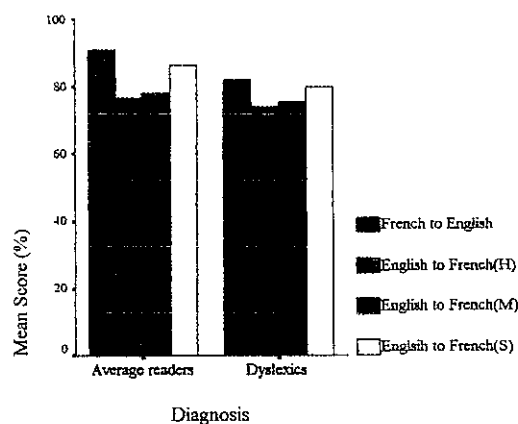
As scores could only increase or stay at the same level when medium and then soft criteria were included, scores after Linkword were naturally still significantly higher than scores before Linkword for the inclusion of medium criteria, $F(1,52) = 60.73$, $p < 0.01$ and then soft criteria, $F(1,52) = 52.0$, $p < 0.01$.

Significant interactions were also seen between time of test and diagnosis for both medium criteria, $F(1,52) = 8.32$, $p < 0.01$ and soft criteria, $F(1,52) = 52.0$, $p < 0.01$. Simple main effects revealed that for the medium criteria a significant difference occurred between the two groups before Linkword was used, $F(1,52) = 15.41$, $p < 0.01$, but no significant difference between the two groups were seen once the programme had been used, $F(1,58) = 0.15$, $p > 0.05$. This pattern repeated for the soft criteria with simple main effects showing a significant difference occurred between groups before Linkword, $F(1,52) = 15.41$, $p < 0.01$,

but no significant differences between the two groups after Linkword was used, $F(1,52) = 3.19, p > 0.05$.

Therefore, an additional increase in final recall was seen when medium criteria were included and again for soft criteria. The pattern of results between the two groups however stayed the same whatever criteria was included. A significant difference occurred between groups before Linkword, with dyslexics performing at a significantly lower level than “average” readers. Once Linkword was used however, this difference disappeared with no significant difference occurring between the two groups. Both groups significantly improved their scores, performing at the same level after Linkword was used.

Figure 3: Comparison of receptive and productive learning for dyslexics and “average” readers (Based on all criteria)



Productive and receptive learning were compared to see what the effect of Linkword was upon these two variables. Recall for French to English scores was compared against recall for English to French scores based on hard, medium and soft criteria using repeated measures ANOVA's.

For the comparison of productive and receptive learning when criteria were soft, no significant differences were found, $F(1,52) = 3.56, p > 0.05$. Pupils were performing at a similar level when translating from French to English translations and English to French. No significant interaction was found either between translation direction and diagnosis was found, $F(1,52) = 0.89, p > 0.05$, suggesting that both groups show similar patterns in both productive and receptive learning.

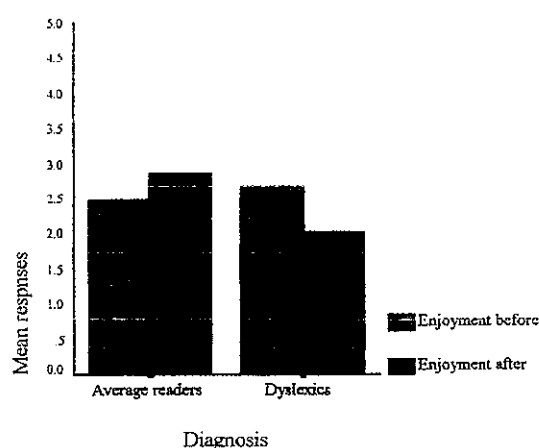
The same comparison was then performed for medium criteria, this time finding a significant difference, $F(1,52) = 5.19, p < 0.05$. Again, no significant interaction was found for diagnosis and type of learning suggesting both groups again show similar patterns in their recall of receptive and productive learning. Using the means, shown in figure 3 this suggest that when soft criteria are excluded, receptive recall is significantly higher than productive recall. Finally, the analysis was performed for hard criteria again finding a significant difference, $F(1,52) = 9.22, p < 0.01$. Again no significant interaction with diagnosis was

found. Both groups found receptive learning significantly easier than productive learning, as supported in figure 3.

Therefore, when recall is stricter, receptive recall is significantly better than productive recall for both groups. However, this difference is removed when soft criteria and therefore responses that are partially correct are included.

The results of the questionnaires completed before and after Linkword was used were then analysed to assess what effect Linkword had on variables such as motivation, enjoyment and confidence. Answers to the questionnaires were on a five-point scale with one being the most positive response and five the most negative response. Therefore a lower bar dictates a more positive response.

Figure 4: Enjoyment of languages before and after training for both “average” readers and dyslexics.



The means shown above in figure four suggest that little difference was reported of general enjoyment of languages before Linkword was used, with both groups reporting in the direction of neither enjoying nor not enjoying languages. After Linkword was used the “average” reader appeared to neither enjoy nor not enjoy Linkword but the dyslexics as a group enjoyed the method.

A repeated measures ANOVA was used to see if significant differences were found in the pupils attitudes to languages before Linkword and their attitude to languages when using Linkword. A significant difference between enjoyment of languages before Linkword and enjoyment of Linkword was not found, $F(1,52) = 0.46$, $p > 0.05$. However a significant interaction was found between reading group and enjoyment of learning, $F(1,52) = 9.50$, $p < 0.05$. Simple main effects were again used to analyse this interaction further finding that there were no significant differences between reading groups in enjoyment of learning before using Linkword $F(1,52) = 0.58$, $p > 0.05$ but significant differences were found in the enjoyment of learning when Linkword was used, $F(1,52) = 8.57$, $p > 0.01$.

Combined with the means shown in figure one this suggests that the dyslexic pupils moved from a neutral reaction towards languages to enjoying them when using Linkword. They enjoyed using Linkword significantly more than the “average” readers.

The “average” group showed a neutral reaction to learning languages through Linkword, neither enjoying nor not enjoying the programme. This was not significantly different to their attitude towards languages before Linkword. Therefore Linkword did not change their attitude to language learning. This neutral attitude was analysed further to see whether this attitude was perhaps affected by other factors. For example, as the group on average knew a higher proportion of the words to be tested before Linkword, a Pearson’s r correlation was performed between percentage of words known before Linkword and enjoyment of Linkword. This found $r(60) = 0.5$, $p < 0.01$, showing that as percentage of words known before Linkword increased so did the point on the scale selected. Those who knew a high percentage of words beforehand therefore enjoyed Linkword significantly less. Therefore a link between these two factors suggests that the “average” readers may not have enjoyed using Linkword as a method or felt that it improved their attitude towards languages, as they already knew many of the words on the programme.

Figure 5: Ease of learning vocabulary before and after training for dyslexics and “average” readers.

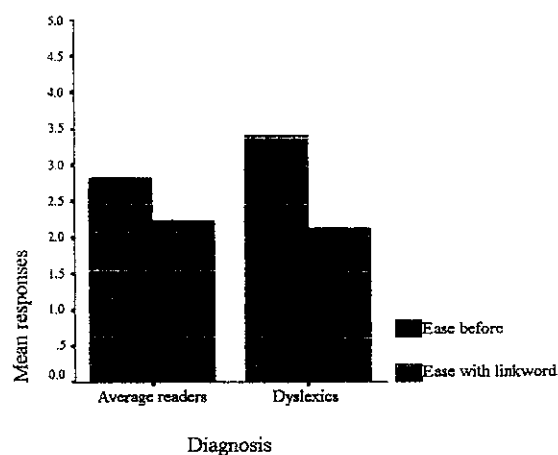


Figure 5 shows that the dyslexics are responding in the direction of a negative answer, finding vocabulary learning difficult before Linkword, compared to the “average” readers who are close to a neutral response. The means also suggest that using Linkword made learning vocabulary easier for both groups, both reporting that it was an easy method.

The results of a repeated measures ANOVA showed that a significant difference was found in ease of learning before and after Linkword, $F(1,52) = 33.26$, $p < 0.01$. Using the direction of the means this shows that learning vocabulary with Linkword was thought to be significantly easier than methods used before. Again a significant interaction was seen between diagnosis and ease of learning, $F(1,52) = 4.42$, $p < 0.05$. Simple main effects were again used to analyse this relationship with a significant difference in ease of learning

vocabulary seen between groups before Linkword, $F(1,58) = 5.07$, $p < 0.05$. However, this significant difference was removed after using Linkword, $F(1,58) = 0.14$, $p > 0.05$

Using the means, this suggests that dyslexics on average find vocabulary learning significantly harder than “average” readers. Using Linkword allows them to find this skill significantly easier, leading them to report ease of learning at the same easy level as “average” readers. Both groups find learning vocabulary with Linkword significantly easier than before.

Figure 6: Ease of learning grammar before and after training for dyslexics and “average” readers

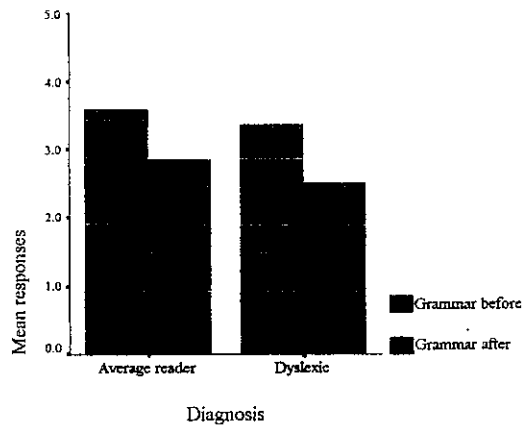


Figure 6 suggests that both groups found grammar difficult to learn before Linkword was used. However, both groups move in the direction of finding Linkword an easier method to learn grammar with, with the “average” group finding it a neutral method and the dyslexic group closer to an easy method.

A repeated measures ANOVA showed significant differences in ease of learning grammar before and after Linkword, $F(1,52) = 15.44$, $p < 0.01$. Combined with the direction of the means this shows that both groups found Linkword a significantly easier method through which to learn grammar than previous methods, with pupils finding grammar before Linkword difficult but after training easy. No significant interaction was found between diagnosis and time of questionnaire, $F(1,52) = 1.03$, $p > 0.05$.

Several one-way ANOVA’s were then performed to analyse questionnaire items that did not provide straight comparisons of questionnaire items. These questions were based on attitudes towards Linkword in comparison to other methods and therefore could not be directly compared due to the scale points. For example, if a pupil was confident before Linkword but Linkword increased confidence these two responses were on the same scale point and therefore comparing them directly with an analysis of variance would not recognize this improvement. They were therefore analysed separately to see if differences arose between groups.

Figure 7: Enjoyment and ease of Linkword compared to other methods for dyslexics and “average” readers.

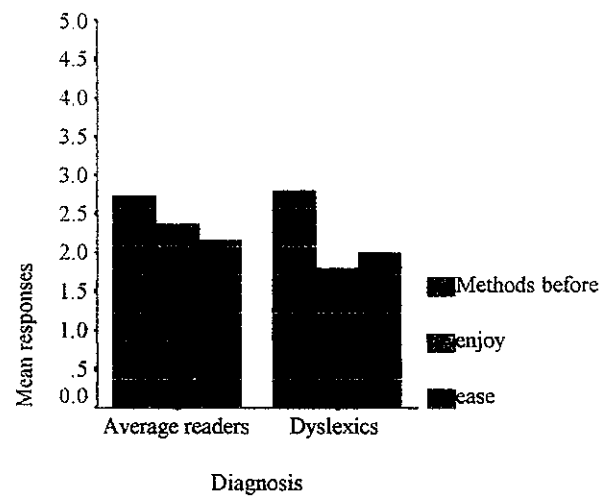


Figure 7 showed that both groups show a neutral answer towards methods to learn languages before Linkword. This was analysed using a one-way ANOVA to see if significant differences occurred between the groups. No significant difference was found, $F(1,52) = 0.13$, $p > 0.05$. Both groups are similar in their attitudes towards methods to learn languages before Linkword was used, neither linking nor disliking methods used.

Figure 7 also shows the two groups attitudes to enjoyment of Linkword in comparison to other methods. Both groups show positive responses, with dyslexics clearly enjoying the method more and the “average” readers reporting in the direction of finding it a more enjoyable method. A one-way ANOVA was performed, finding a significant difference between the two groups, $F(1,52) = 4.25$, $P < 0.05$, which combined with the means, shows the dyslexics enjoyed Linkword compared to other methods significantly more in comparison to “average” readers. Both groups however enjoy the method more than others used.

Attitude towards ease of Linkword compared to other methods is also shown in figure 7, showing that both groups find Linkword an easier method than other methods to learn languages. No significant difference between the two groups was found for this attitude, $F(1,52) = 0.53$, $p > 0.05$. Both groups found Linkword easier than other methods.

Figure 8: Motivation of training for dyslexics and “average” readers

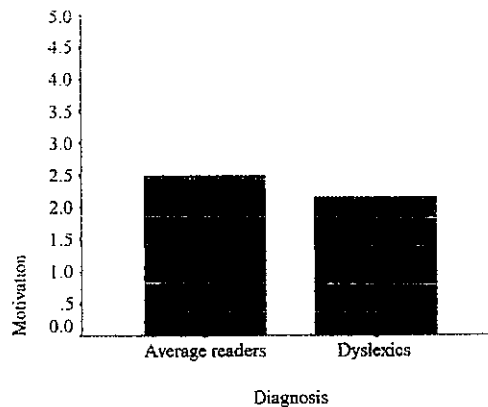


Figure 8 shows the motivation of Linkword upon the pupils. Both groups reported positive answers, but no significant difference between groups was seen, $F(1,52) = 2.11$, $p > 0.05$. Both groups are motivated to put more time, effort and concentration into learning languages when using Linkword.

Figure 9: Confidence levels before and after training for “average” readers and dyslexics.

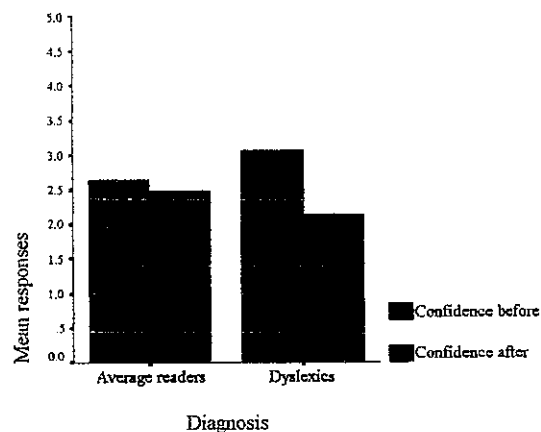


Figure 9 reports the confidence levels of pupils towards their ability to learn languages before and after Linkword was used. This shows that whilst both groups are responding neutrally to their confidence levels before Linkword, dyslexics are showing lower mean confidence levels than the “average” readers. However, a one way ANOVA showed that no significant difference was seen between the groups, $F(1,58) = 3.01$, $p > 0.05$.

Also reported in figure 9 are the pupil’s responses to whether Linkword made them more confident in their ability to learn languages, with both groups reporting that the programme made them more confident. Again no significant difference was seen in confidence levels

after Linkword between the “average” readers and the dyslexic pupil’s, $F(1,58) = 2.11, p > 0.05$.

Therefore, both groups were neither confident nor unconfident in their ability to learn languages before Linkword was used. However, both groups reported that Linkword increased their confidence in their ability to learn languages.

Figure 10: Level of language expected to learn to before and after training for both “average” readers and dyslexics.

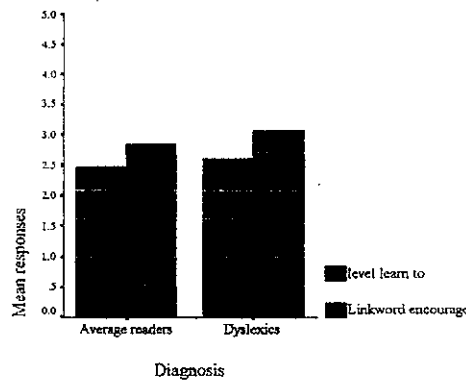
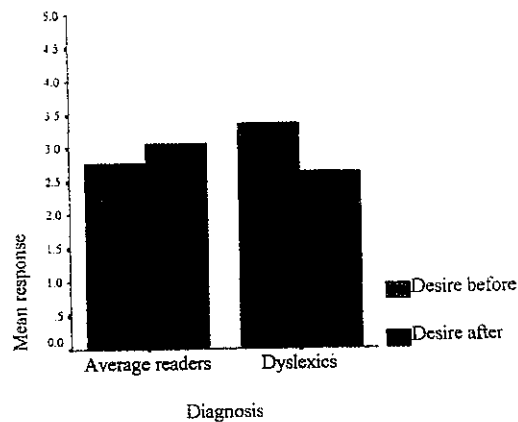


Figure 10 shows the academic level that the pupils wished to learn languages to before and after using Linkword. Before Linkword both groups appear to want to learn languages to the same level of GCSE, with a one way ANOVA showing no significant difference in this level, $F(1,52) = 0.53, p > 0.05$.

Pupils were also questioned to whether using Linkword would affect the level at which they would learn languages to. Also displayed in figure 10, this revealed that both groups are neither encouraged nor discouraged to learn languages further by Linkword. Again the one way ANOVA showed no significant difference between the two groups for Linkword’s influence to learn languages to a higher levels, $F(1,52) = 0.52, p > 0.05$. The means therefore suggest that Linkword is not encouraging learners to learn to a higher level but is not discouraging them either. It is not effecting their decision to pursue languages to a higher level.

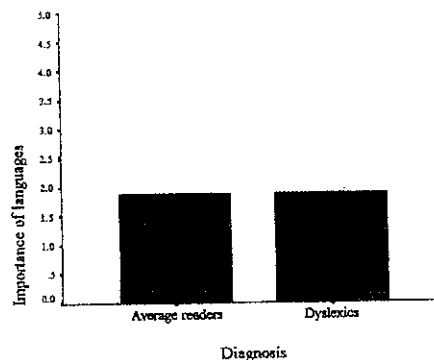
Figure 11: Intention to learn more languages and effect of training on this intention for both dyslexics and “average” readers.



Pupils also gave responses to whether they would like to learn more languages before they used Linkword. Figure 11 suggests that neither “average” readers nor dyslexics would like nor dislike to learn more languages. No significant differences were found between groups, $F(1,52) = 2.11, p > 0.05$.

Pupils also reported as to whether Linkword encouraged them to learn more languages. Figure 11 shows that both groups are neither encouraged nor discouraged by linkword to learn more languages. Again no significant difference was found between dyslexics and “average” readers, $F(1,52) = 2.47, p < 0.05$.

Figure 12: Dyslexic and “average” readers opinions of the importance of languages



The means in figure 12 show that both “average” readers and dyslexics believe languages to be important and useful. No significant difference between these attitudes was found, $F(1,52) = 0.57, p > 0.05$. Both dyslexics and “average” readers believe languages to be important.

Pupils with reading difficulties not defined as dyslexia

The investigation was originally designed to also look at the impact of Linkword on those children diagnosed with reading difficulties not defined as dyslexia and to compare this group to the “average” readers and the dyslexic pupils. However, the sample size out of the classes available to test was too small with only six pupils having this diagnosis. It was therefore decided to omit them from the main analysis and analyze their responses speculatively as a group on their own. It was however recognized that any results might not be methodologically correct, as the sample size was small.

Figure 13: Scores before and after training (based on hard criteria)

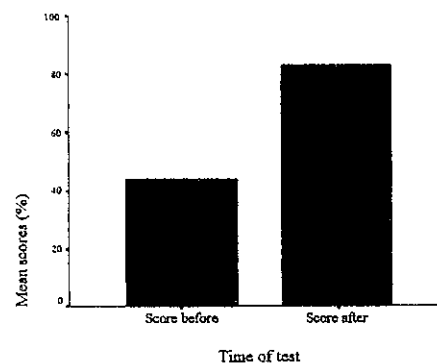
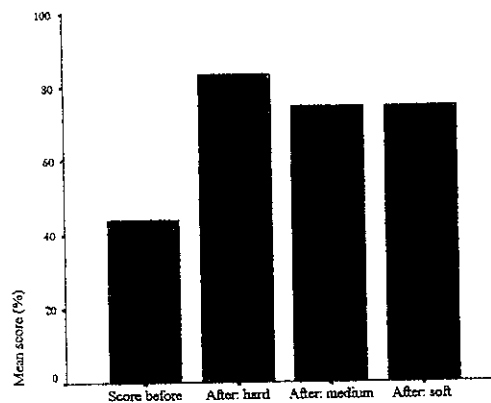


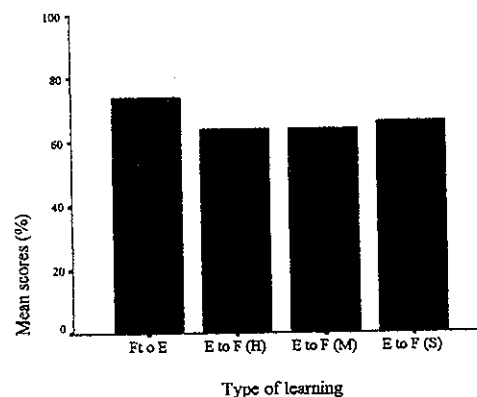
Figure 13 shows that scores before Linkword are much lower than scores after. A repeated measures ANOVA was performed showing a significant difference in scores before and after Linkword, $F(1,5) = 30.14$, $P < 0.01$. Using the mean scores shown in figure 13, the poor readers are showing a significant improvement on what they know after using Linkword. Comparing this to figure one they are showing similar final scores to the “average” readers and the dyslexics.

Figure 14: Scores before and after training (based on all criteria)



Similarly to the main analysis, scores before Linkword were then compared to post - Linkword scores when medium and soft criteria were included. When the scores before Linkword was used were compared to the post - Linkword scores including medium criteria, using a repeated measures ANOVA, significant differences were found, $F(1,52) = 10.01$, $p < 0.05$. Post - Linkword scores were significantly better than scores before training. Again, the same analysis was performed but including soft criteria in the post score. A significant difference was again found between scores, $F(1,52) = 30.14$, $p < 0.01$. Including the soft criteria therefore has the effect of lowering the significance level from 0.05 to 0.01.

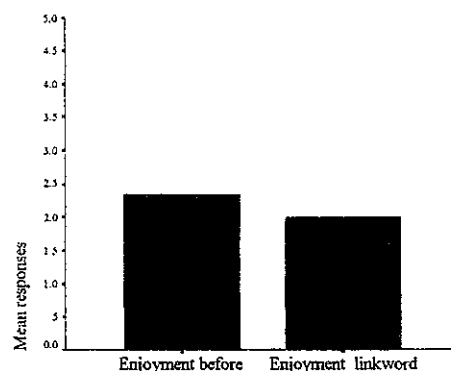
Figure 15: Comparison of receptive and productive learning for all criteria.



Productive and receptive learning were compared for hard, medium and soft criteria, to see if recall levels differed. No significant difference was seen between productive and receptive learning, $F(1,5) = 2.18$, $p > 0.05$ when hard criteria were taken into consideration. This pattern repeated when medium criteria were used, $F(1,5) = 2.18$, $p >$

0.05. Finally, no significant differences were seen between productive and receptive learning when soft criteria were included, $F(1,5) = 1.38$, $p > 0.05$. Recall for productive and receptive learning were therefore at similar levels for all criteria for the poor readers.

Figure 16: Enjoyment of languages before and after training



Enjoyment of languages before Linkword and enjoyment of Linkword was compared. Figure 16 suggests that although poor readers enjoyed Linkword they also enjoyed learning languages before Linkword as well.

A repeated measures ANOVA found no significant difference in enjoyment of learning languages before and after Linkword was used, $F(1,5) = 1.0$, $p > 0.05$. Studying figure 16 shows that although no significant improvement was seen, poor readers did enjoy the programme, but they also displayed a positive attitude to languages before Linkword was used as well. Therefore although their attitude towards languages did not change through using Linkword, they did enjoy the method.

Figure 17: Ease of learning vocabulary before and after training

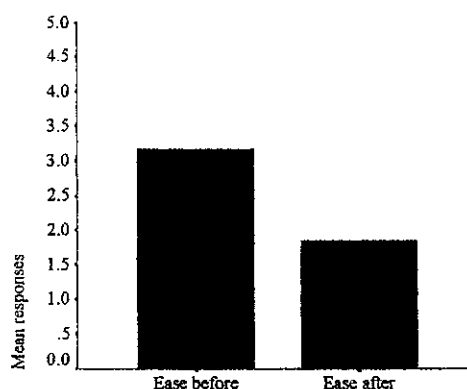


Figure 17 shows that poor readers find learning vocabulary neither easy nor difficult before Linkword. However, after Linkword they report that vocabulary is easy to learn

with Linkword. Using a repeated measure ANOVA it was found that a significant difference between ease of learning vocabulary before and after Linkword, $F(1,5) = 8.45$, $p < 0.05$ occurred. Using Linkword lead to vocabulary being easier to learn.

Figure 18: Ease of learning grammar before and after training.

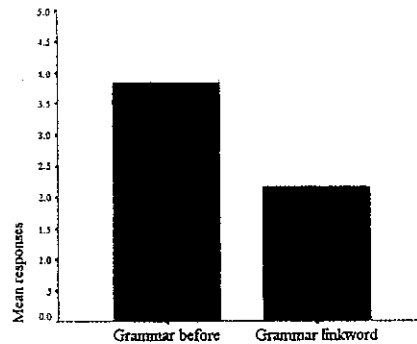


Figure 18 shows that poor readers find grammar difficult to learn before Linkword. However, when using Linkword, it is shown that they find grammar easy to learn. A repeated measures ANOVA showed a significant difference was found in ease of learning grammar before and after Linkword was used, $F(1,5) = 25.0$, $p < 0.01$. Poor readers found using Linkword to learn grammar significantly easier than before.

As there was no comparison group, for the questions that targeted Linkword in comparison to other methods, only the means were used to show response.

Figure 20: A comparison of ease and enjoyment of Linkword to other methods.

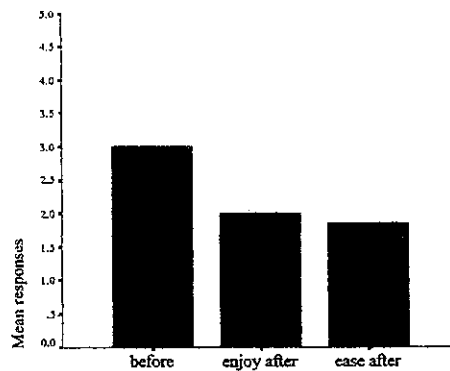
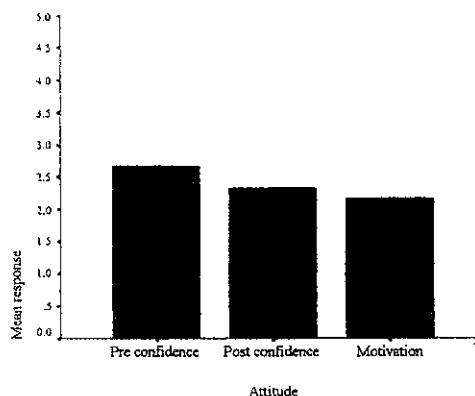


Figure 19 shows that before Linkword the poor readers on “average” neither liked nor disliked methods to use to teach languages. However, in comparison to other methods they found Linkword easier and more enjoyable to use.

Figure 20: Confidence levels for language learning before and after training



Again, confidence levels could not be directly compared to see if significant differences occurred before and after Linkword. However figure 20 shows that whilst confidence levels before Linkword were in the direction of being neither confident nor unconfident, using Linkword made the poor readers more confident about learning foreign languages. This was also seen for motivation, with Linkword motivating the poor readers to learn languages.

Figure 21: Level of language expected to learn to before and after training

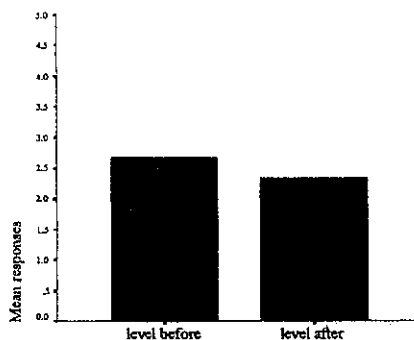
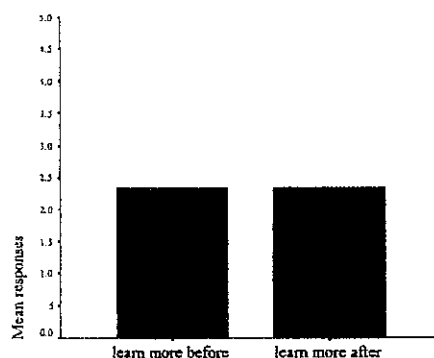


Figure 21 shows that poor readers on average plan to learn languages until approximately GCSE level. The mean level after however suggested that Linkword does encourage poor readers to learn languages to a higher level.

Figure 22: Intention to learn more languages and effect of training on this intention.



The means shown above in figure 22 suggest that although poor readers would already like to learn more languages before Linkword was used, that using Linkword would also encourage them to do so.

In conclusion, both dyslexics and “average” readers showed a significant improvement in final recall when compared to their prior knowledge. Whereas before Linkword the dyslexic pupils were performing at a significantly lower level than the “average” readers, using Linkword lead the dyslexic pupils to perform at the same level as the “average” readers. Both showed high final recall after using the programme.

With regards to attitudes to the questionnaires, both groups in general showed positive reactions, enjoying the method, finding it easy and reporting that it made them more motivated and confident in relation to learning languages. The programme had a positive effect on their attitudes towards language learning in general. Neither group responded with a negative answer for any question regarding Linkword.

Results for the poor readers followed the same pattern, with Linkword significantly increasing their recall, with the group also reporting similar positive attitudes towards the programme.

Discussion

The results of this study challenge the idea that dyslexic children are not capable of achieving at, or enjoying foreign languages. They also provide further support to the accumulation of positive research involving the Linkword languages programme.

The percentage of words correctly known on the test before Linkword by the dyslexic pupils supported previous research which suggested that dyslexic children face problems with learning foreign languages and perform at a poorer level than their non-dyslexic peers (e.g. Crombie, 1997). Their pre - Linkword knowledge was found to be significantly less than that of the "average" readers suggesting that through their lessons and experience with French, these children have learnt significantly less than the "average" readers.

However, post - Linkword performance scores dispute the notion that dyslexic pupils are destined to perform poorly whatever the circumstances. Firstly, both groups significantly improved their knowledge on the test, achieving high final scores through a method they were only exposed to for approximately forty minutes. Secondly, no significant difference was found between the scores of the dyslexics and "average" readers. The advantage that "average" readers had pre - Linkword was removed through using the Linkword programme and both groups performed at a similar high level.

A central point that should be emphasised here is that these significant conclusions are based on "hard" criteria marking. A distinction between hard, medium and soft criteria was originally made as previous studies have suggested that Linkword does not facilitate productive learning (Ellis & Beaton, 1993). Although this claim has been refuted with evidence suggesting that it does improve productive recall, it was found that productive recall with Linkword was only significantly higher than control methods when soft criteria were included (Gruneberg & Pascoe, 1996). However, although there was no control group to compare with, in this study, significant improvement in score for both groups was found with post - Linkword scores based on hard criteria.

The productive recall for all three criteria was compared to receptive recall to see if significant differences occurred between these. Although no significant differences were seen between productive and receptive recall for soft criteria, differences were found for medium and hard criteria. This suggests that Linkword is leading to equal recall when evidence of learning is present (soft criteria) but productive recall is lower than receptive recall when stricter marking is used. However, it should be remembered that productive recall was still high for both groups when based on hard criteria with both groups performing at over 70%. Productive learning after Linkword was still significantly higher than the scores before Linkword was used for both groups, which were based on a combination of productive and receptive learning. Also, sixty eight percent of the students did not actually benefit from an inclusion of medium or soft recall, as all correct answers given were fully correct. This suggests that Linkword *is* facilitating productive learning for all criteria, but to an even higher extent when soft criteria are included. This finding challenges the idea that Linkword does not facilitate productive learning and also suggests that perhaps the effect is not constrained to only soft criteria marking.

It was felt that it was important to include the distinctions of hard, medium and soft recall due to the sample groups used. Productive learning is felt to be harder due to the fact that the learner has to produce unfamiliar orthographic and phonological patterns (Pressley & Levine, 1981). As these skills are some of the main deficits in dyslexia, (Crombie, 2000) it would be

predicted that the amount encoded by the dyslexics might be obscured if only fully correct answers were accepted. However, no significant differences were seen between the two groups for hard, medium or soft recall. Also, although it cannot be statistically compared as the hard, medium and soft scores were embedded within each other, it appeared that it was the "average" readers who were benefiting most from the inclusion of soft recall, with a greater difference seen between the medium and soft recall for this group than for the dyslexic group. It was predicted that the dyslexics would show a greater increase in their recall when soft criteria were involved due to their problems with phonology. However, a greater proportion of the dyslexics overall productive score was more accurate than the "average" readers. This supports the idea that Linkword enables dyslexic pupils to overcome their fundamental problems with language learning.

It is also important to note that neither group performed at ceiling level. Very few pupils achieved one hundred percent on their post – Linkword test suggesting that there was still room for improvement. Therefore, the similarity in scores was not due to the fact that both groups had not had opportunity to show that one could outperform the other due to too few a questions or the standard being too easy. If both groups had reached one hundred per cent, although very positive performance wise, it would have been harder to discriminate between the two groups as either group *could* have possibly achieved higher. However, both groups could have achieved higher scores but instead levelled at similar mean scores.

These conclusions show that dyslexic children *are* capable of learning vocabulary, and are capable of learning it to the same standard as their non-dyslexic peers. This finding challenges those authors who have suggested that dyslexic children cannot or should not be "forced" to learn languages such as Levine (1987) and the Department of Educational Standards (2002). What it does show is that dyslexic children do perform at a lower standard with traditional classroom teaching but that with appropriate teaching strategies the child with dyslexia can achieve and do so to a high standard. This finding provides empirical support for McColl's (1997) suggestion that the performance of a child with dyslexia is not dependent purely on the child but on the school and its teaching strategies as well.

The findings from this study are also in accordance with previous research which showed success of Linkword with children who were struggling with languages at Rugby school (Sommer & Gruneberg 2002) and that of Maybury (2002) who found that Linkword facilitated recall in those with dyslexia. Taken together these results and the current findings suggest that Linkword is providing those who struggle with language learning, especially those with dyslexia, with a practical and usable strategy that they can use to develop their knowledge base.

This improvement in scores is probably linked to a number of features of the programme. With regard to increased recall, the use of the keyword method underlying the programme is certainly boosting recall. Associations are being strengthened in memory between the two words due to the use of two interrelated codes – one verbal and one visual, increasing the chances of recall. This method is allowing the dyslexic child to overcome their usual disadvantage when teaching methods are based mainly on forming phonological links. As dyslexics are also seen to benefit from mnemonic strategies due to their right-brained strengths (West, 1987), this also allows them to meet the standard of the "average" readers. Also, as dyslexics have been shown to have intact visual memory skills (Hulme, 1987), this visual method allows them to encode and recall at the same level as the "average" readers. They are not at their usual disadvantage due to their poorer phonological skills, as the method does not rely on this ability unlike traditional methods of teaching.

The questionnaires also provided positive feedback to the programme, revealing insight into the attitude of both types of reader towards using Linkword to learn languages and towards languages in general. These responses which encompass the programme as a style of learning as a whole, rather than just the theory involved are also important due to the known link between factors such as motivation and performance (Ganschow et al, 1989).

Enjoyment and ease

Before using Linkword, both “average” readers and dyslexics reported that they neither liked nor disliked languages, with no significant difference seen between the two groups. This was interesting as it was predicted that the dyslexics would show a poorer attitude towards languages before the programme was used, as they were performing at a lower level than the “average” readers. However, it could be suggested that at this age, perhaps performance is not the sole factor that leads to enjoyment of languages. The pupils will not sit any major exams such as GCSE’s this year, meaning that performance does not have the same implications. Also, the pupils may see language lessons as more variable, fun and less stressful than lessons such as maths. Perhaps if the study was repeated with pupils who were being forced to study languages for their GCSEs, the dyslexic children may report more negatively.

After using the programme, the dyslexic pupils reported that they enjoyed learning languages when using it. This is not a significant improvement from their attitude to languages before Linkword, but they move from responding neutrally towards enjoying languages. Linkword is raising dyslexic children’s enjoyment of language learning. This is a critical point as Ganschow & Sparks (2000) noted how anxiety and poor self-esteem lead dyslexic pupils to not enjoy languages. As dyslexic children are reporting that they now enjoy languages through using Linkword, it is thought that the programme is removing anxiety and raising esteem in relation to languages. The “average” readers did not show this reaction towards using Linkword to learn languages, reporting that they neither liked nor disliked the method. However, this was linked to the fact that they knew a greater percentage of the words on the programme before hand, which would probably have led them to become bored. If the study was to be repeated, a higher level of the programme should be used with more able pupils, targeting subject areas that they do not know. It would be expected that they would then enjoy the programme more as has been shown in previous studies such as at Bishop Vaughan school (Gruneberg & Jacobs, 1991). It should also be noted that this attitude is neutral and not a negative response.

Importantly, a significant difference was found in enjoyment of Linkword between the two groups, with the dyslexic children enjoying it more than the “average” readers. This result was expected as the programme improved the dyslexic pupil’s recall to a greater extent than it did the “average” readers. Although the “average” readers achieved a high percentage score using the programme, the dyslexic pupils equalled this score, rising from a far lower level. Also, additional factors associated with the design and presentations of the programme such as privacy, pace and the use of the computer as suggested by Myers & Ganschow (1998), were expected to be more beneficial to the dyslexic child than they were to the “average readers”, therefore boosting their enjoyment of the programme. A more detailed analysis of these factors associated with enjoyment could be done in a future study. For example, pupils could be asked to rate the pace, privacy and computer format of the programme, to see if these contributed to the enjoyment score. It would be predicted that these would correlate more strongly for the dyslexic pupils as they help remove some of the

deficits that dyslexic experience in language lessons that those who achieve do not face in the same way.

Ease of learning vocabulary and grammar was also investigated. Before Linkword the two groups significantly differed on how easy they found learning vocabulary, with the “average” readers reporting that they find languages neither easy nor difficult (2.8), whilst the dyslexics find them difficult (3.5). This reflects previous research such as Downey et al (2000) who reported that dyslexics find languages difficult and also supports the above suggestion that enjoyment of languages is not solely a factor of how easy pupils find them. With regard to grammar both groups found learning grammar through current teaching methods difficult. After using Linkword however, both groups reported that they found learning both vocabulary and grammar easy, with no significant differences seen between the two groups.

This also shows that although the “average” readers did not enjoy the programme, they did find it easy, supporting the idea that they were probably not challenged by the section chosen.

These reactions to the programme are critical from an educational viewpoint. Dyslexics have classically been seen as finding foreign languages difficult, an idea that is supported by their scores before Linkword was used, and attitudes towards language learning. However, the results have shown that dyslexic children find Linkword easy and perform at a higher level when using it. It would therefore make sense for educators to consider incorporating this method into teaching dyslexic children, allowing them to benefit from learning a foreign language rather than suggesting that they cannot learn it and should drop it. With traditional phonological methods, yes, the dyslexic child does find languages difficult and does perform at a poorer level, but this research suggests that it is the method of teaching and not purely the deficits of the dyslexic child that are causing this, again supporting Crombie (1997).

It would be interesting to see whether measures of ease changed if pupils were provided with feedback of their results before they answered the final questionnaire. It is possible that some pupils may not want to say that they found the programme “very easy” if they are unsure of their marks. Leaning on cognitive dissonance theory this may suggest that the reported measure of ease may rise as the pupil will no longer feel in a state of dissonance if they didn’t do as well as they had suggested by claiming the programme was easy. This may be especially pertinent for the dyslexic pupils who may be accustomed to achieving poor marks in the past as due to their lowered self esteem (Riddick, 1996), they may feel they are incapable of doing well and may therefore hold back on their evaluation of Linkword in the absence of proof of performance.

In comparison to other methods

How pupils rated their experience of Linkword against traditional classroom methods was then examined. It was felt that reaction towards Linkword not only had to be positive, but more positive than other methods for it to achieve as an educational instrument.

Both “average” readers and dyslexics neither liked nor disliked methods used previously, with no difference seen between them. It was expected that dyslexic children would like methods used less than “average” readers as traditional methods focus on their weakness, but no difference was found. This however could be a reflection that at this age the pupils have never really considered *how* they are taught – they just are. Also, if they have been taught by the same methods throughout their time learning languages, they may have no benchmark to which to compare to. It would be interesting to reassess what pupils think about traditional methods after they have experienced a programme such as Linkword.

It is also worth noting that although the “average” readers are scoring reasonably high (61%) without Linkword, they neither like nor dislike the methods used to teach them. Perhaps if pupils were more inspired by teaching methods they would be encouraged to gain greater competence in them as is so sought after by educators at present.

Comparing Linkword to previous methods, both groups reported that they found Linkword both more enjoyable and easier. The dyslexic group found the method more enjoyable in comparison than “average” readers did, suggesting that whilst the programme is appealing to both groups more than other methods are, there are additional factors within it that are especially important for the dyslexic pupils. This again would be expected to be factors such as pace, privacy and visual learning, all of which appeal to both groups but have added significance for the dyslexic pupils due to the problems they face in language learning. Again, a more detailed analysis could ascertain *why* the programme is more enjoyable and why it is more enjoyable for the dyslexic pupils.

It should also be remembered that when asked whether they enjoyed Linkword, the “average” readers responded neutrally, however, here they are responding in the direction of enjoying it more than other methods. Although before Linkword was used they claimed to neither like nor dislike other methods this implies that maybe Linkword has made them think more about other methods, realising that there are more enjoyable ways of being taught. Also, perhaps this means that whilst they did not enjoy their experience of Linkword this time, probably due to the prior amount of words known, they feel overall it is a more enjoyable method than other methods encountered. They feel that they would enjoy using it more than other methods to learn *new* vocabulary.

Both pupils with and without learning difficulties are therefore reporting that this method is both more enjoyable and easier than current methods used. If educators are looking for ways in which to bolster attitudes and uptake with regards to languages then this suggests that this programme could be a good step toward achieving these goals as it accomplishes both improved performance and attitudes in one programme.

Of course, it is possible that part of this preference may have occurred due to factors such as novelty and a break from usual work and routine. It would be interesting to run the experiment over a longer period of time, perhaps with one lesson a week for three months, and then take a measure of attitudes. This could be compared to a measure taken after two or three sessions to see if these positive attitudes remain constant. In this situation measures of confidence and motivation could also be tracked to see if these change as the pupils receive positive performance feedback. As levels of motivation and confidence have been seen to be low in dyslexic pupils (Ganschow & Sparks, 2000) a sharper increase would hopefully be seen, with perhaps an equal rating to “average” readers in these areas as well as performance.

Confidence and motivation

Before Linkword was used both groups reported that they were neither confident nor unconfident about learning languages, with no significant difference found between the two groups. This was surprising as it was expected due to their lower scores before Linkword was used and the fact that they found learning vocabulary and grammar difficult, that the dyslexics would be less confident. However, perhaps at this age the pupils did not want to admit to themselves or others that they were not confident as lack of confidence could be seen as a weakness, especially in a very good school where confidence levels were expected to be more positive in general.

After Linkword was used however, both groups reported that they felt both more confident and more motivated by the programme. Due to their high scores and the fact that the pupils found the programme easier and more enjoyable than other methods, it is not surprising that they felt more confident and motivated by it as well. These increases are critical elements of the findings for all pupils due to the relationship seen between increased motivation and confidence and increased performance such as that noted by Ganschow et al (1989). Not only is performance boosting confidence and motivation but also increases in these elements will act back positively upon performance. A more detailed analysis now needs to be done to pinpoint the reasons to why exactly Linkword increase motivation and confidence.

The findings have increased significance for the dyslexic pupils due to evidence of their documented low levels of confidence (Edwards, 1994) and motivation (Ganschow et al, 2000). The programme allows them to realise that they *can* learn languages through avoiding the problems they face in normal language lessons, allowing them to interact in a fuller and more positive manner, without the risk of feeling embarrassed or ashamed. This increased confidence should also help to remove the anxiety they can develop towards language lessons as noted by Horwitz et al (1986). All of these factors may lead languages to be seen as a more positive option in schools, rather than their recognized low position in the hierarchy of enjoyable subjects as noted by Stables et al (1999).

The fact "average" readers who were already performing at a fairly positive level before the programme also reported that they were motivated, suggests that language teaching at present, although helping their performance is not motivating pupil's to learn. This suggests that even "average" students have a greater potential to achieve with a method of teaching that they feel positively about. Strategies to increase motivation should therefore be aimed at all and not just those who are not achieving. As Linkword is improving the performance and attitudes of both types of reader, this programme could be a solution to this need.

Further Learning

It was also investigated as to whether Linkword had any affect on pupil's desire to learn languages to a higher level or to learn more languages. Before Linkword, no significant differences were found between the levels that the two groups wanted to learn to, with on average the pupils wanting to learn until at least GCSE. This was surprising, as it was expected that the dyslexic pupils, as they found languages more difficult, would want to drop languages sooner. However, it is felt that this is tied in with another question that measured the pupil's attitudes to the importance of languages. Both groups felt that languages were important, with little difference seen between the two groups on this measure. Therefore, perhaps, the dyslexic pupils, even though they are finding languages more difficult, want to persevere, as they believe they are an important qualification. It would be interesting to analyse this further to see if the pupils give this reason. However, it should be noted that although both groups believed languages to be important, neither group strongly reported in the direction of learning to A level where any real competence is gained, which is a worrying finding for educators.

Using Linkword neither encouraged nor discouraged both groups to learn to a higher level or to learn more languages with no differences seen between the two groups. It was expected that perhaps the dyslexic group would be encouraged to learn further or to learn more languages with the programme, but this was based on the assumption that they would want to drop languages sooner than reported. Linkword therefore, although making languages easier and more enjoyable than other methods does not encourage learning more languages or to a higher level.

Perhaps this is a reflection however on factors other than Linkword. Firstly, as the pupils were only in year nine, and had not even started their GCSE syllabus yet, they may not have thought about A level subjects. Also, and probably most importantly, pupils only do a few A/As levels and therefore have to choose their choices carefully. Unless they are already deciding to do a languages degree (in which case they would probably be fairly competent already) although they may want to, they may not choose languages in favour of science subjects in order to get them onto the course which they want at university. Perhaps the question could be rephrased to “if subject choice was unlimited, would you be encouraged to learn to a higher level?” With regards to learning more languages, perhaps the fact that the pupils are already learning languages and therefore there are only so many they can deal with at once. A more in depth analysis could ask *why* it is not encouraging them. It is hypothesised that pupils would refer to factors unrelated to Linkword. Similarly, the experiment could also be repeated with pupils who have just started learning one language, to see if it would encourage further involvement. Also, the pupils at this point had not had their results back. Perhaps if they had seen their scores before answering, responses may have been different. Making a decision to learn more languages or to learn further is probably based on an interaction of enjoyment and score rather than just a positive attitude. If they saw the extent to which it boosted their scores, they may have been encouraged further. Final questionnaires in the future should perhaps be given after feedback.

The finding that not only are pupils performing highly when using the programme but that their attitudes are very positive in terms of motivation, confidence and enjoyment is very important due to the idea that the attitudes interact with and affect performance. It is not enough for a strategy to simply improve recall as if the pupils are not motivated by it, as in the long term they will not perform to the level they are capable of. Factors such as confidence and enjoyment can affect motivation and therefore, as these factors are so interlinked it is a definite strength of the programme that it can improve a multitude of attitudes and performance in both “average” readers and pupils who struggle with languages such as dyslexics.

Children with Reading difficulties not diagnosed as dyslexia

Exactly the same investigations were performed for the poor reader sample as a separate independent group. Although these results are again very positive, it is realised that they cannot be generalised to the same extent due to the small sample used. Further investigations need to recruit a larger poor reader sample so that firstly the results are more reliable and secondly they can be compared to the dyslexic and “average” reader samples. The results however will be briefly analysed as a group and speculative conclusions drawn.

Firstly, performance (based on hard criteria) for this group followed the same significant rise, bringing them up from a score before Linkword was used, that was similar to the dyslexic group, to a post – Linkword score on a level with both the “average” readers and dyslexics. Again Linkword has brought a group that are known to have problems with foreign languages up to a high level, equal to those who showed better pre – performance than them. Productive and receptive learning were also compared, interestingly finding no significant differences between receptive and productive learning when productive learning was based on hard, medium or soft recall. As recall was high for all three conditions this again speculatively supported the above conclusion that Linkword can successfully facilitate productive learning.

Again, the attitudinal measures also showed positive reactions to the programme. Although this group reported enjoying languages before Linkword was used, they also enjoyed using

the programme to learn languages. With regard to ease, the poor readers found vocabulary learning neither easy nor difficult and grammar hard to learn. Post – Linkword responses however showed that they found both elements easy when using the programme.

The comparison of Linkword to other methods also again came out in a positive light. The poor readers revealed that they neither liked nor disliked previous methods used to teach languages. However, they found Linkword both more enjoyable and easier than other methods used in the past.

With regards to confidence and motivation a similar pattern again emerged. Before Linkword was used the poor readers reported that they were neither confident nor unconfident, whilst after using the programme, this group also reported that the programme increased both their confidence and motivation.

The questionnaires revealed that the poor readers wanted to learn languages to approximately GCSE level and also wanted to learn more languages. Interestingly, in comparison to the other groups, they also reported that Linkword would encourage them to learn not only to a higher level but more languages as well. It should be noted that this was a weaker result however with the means as 2.4 for both post - Linkword responses.

The majority of these reactions are very similar to the reactions of the dyslexic group with similar reasons such as privacy and computer control speculated to play an important role in the development of these attitudes. These findings are interesting, as the poor readers were not expected to benefit from the programme to the same extent due to their lower IQ's (Snowling, 2000). This was expected to affect performance, which was thought would impact on attitudes to some extent. However few differences are seen. These findings are important due to the similar problems the two groups face in the classroom in terms of performance and motivation. The conclusions discussed above can all be speculatively applied to this group however as naturally, increased motivation, confidence, enjoyment and ease all encourage positive reactions to learning languages through Linkword. Unfortunately the sample size is not large enough for bold statements to be made about the affect of Linkword upon children who are poor readers but the essence of these findings should definitely prompt further research on the success of Linkword for such a sample.

Methodological Issues

The study did present a number of methodological problems that could be suggested to alter the reliability of the evidence and conclusions suggested above. Many of these problems arose from the problems of working in a real life situation in the classroom due to time constraints and problems of controlling all elements of the study.

One example is the pre – performance measure of marking words already known on the question list before the vocabulary test to gain a measure of what the pupils have learnt through their lessons before Linkword. A more effective way to gain this information would have been to give them the question sheet before they started the Linkword programme and compare this to the test given after Linkword was used. However, time was short as only two lessons were given of thirty-five minutes each and therefore a further fifteen minutes would have been taken away by implementing this approach. Therefore the pupil's memory and integrity had to be relied on to judge what words they already knew. It was however expected that pupils memories could be confused by interference from words they had learnt from Linkword and that they may have felt under pressure to mark words that they felt they should have known before Linkword was used, although it was heavily stressed that they should think carefully about each word before marking it and that this was not a test that they

would be judged upon outside of the study. It was made clear that this was not a test for their teachers benefit, but a test of Linkword as a learning strategy rather than their own competence. However, their class teacher was present and this may have cause more words to be marked than the pupil truly knew. The class teacher was however present for each class, so the same pressures did exist for every pupil.

However, on top of this problem, although the teachers were instructed to tell pupils to mark words known, two classes did not mark down which words they knew. The only way this could be rectified was to ask them a week after the test to mark on a new question sheet which words they knew before learning Linkword. This presented the same problems as described as above but also the problem that as time had passed, memory for what they knew before and what they had learnt from Linkword may become even more blurred.

Obviously these methods were not perfect but were heavily affected by the real life situation and would be rectified if the study could be repeated with more time and access to a much greater number of pupils. In a situation where more time and participants were available a control group could also be used to learn the same words but through rote learning. However although this would provide a comparison group the problem arises to teaching a class a large amount of words through rote learning. These lessons would be boring and uninteresting for the pupils and therefore they may not cooperate to the same extent.

One element, which may have influenced the results, is due to the sample studied. Although these pupils had been diagnosed as dyslexic it was felt through studying their reading age and IQ scores that perhaps these pupils had been given extensive tutoring to raise their reading level. The pupils were attending a school with a good academic record which was also fee paying and perhaps the average parent would have the money to spend on tutoring the child to perform at a higher level. However, although reading age scores were surprisingly high for dyslexic children, it was felt that perhaps these children had been taught to visually recognise individual words rather than improving in phonological reading ability, a phenomena which is referred to as barking at print. Here the child has learnt to recognise the word visually but still has poor reading ability for words that they have not encountered to the same extent. This was suggested as Hedderly reading scores, which measure reading rate, were below average, as expected for dyslexic children. These scores are a lot more difficult to improve than reading age is through tutoring. In addition to this, pre - Linkword knowledge was at a significantly lower level than "average" readers, which is another sign of dyslexia. A factor such as this probably would not have been targeted in the same way as reading age would have through tutoring and therefore remains as a deficit in the dyslexic child. This poor performance in foreign languages also suggests that phonological ability hasn't been improved through tutoring – instead the child has been taught to recognise common words.

Therefore, overall it was decided that these pupils diagnosed as dyslexic did still have the deficits associated with the disorder but they had been tutored to enable them to read at an expected developmental level. These pupils were felt to be representative of a sample of dyslexic children but it may be interesting for further study to seek a contrasting sample of dyslexic children to see if differences occur.

However, despite the above considerations, the overall conclusions of the research are very positive. None of these reflections are felt to render the results insignificant, as the general attitudes throughout the programme are so strong. These results challenge assumptions about dyslexia and foreign language learning and provide yet more support for a well-researched programme. What needs to be done now is further work to support this evidence.

Future Research

Apart from those suggested above, several elements of the study could be further analysed or manipulated. Firstly, the target language could be manipulated. Many authors have suggested that certain languages are easier for the child with dyslexia to learn due to their similar orthographic and phonological patterns such as Spanish or Italian. French and German on the other hand are felt to be more difficult for the child with dyslexia to learn (Pollock & Walker, 1994). Although this study suggests that children with dyslexia are capable of learning French vocabulary to a high level using the Linkword programme, it would be interesting to see whether this generalises to other languages and the affect this has on performance – whether it would be enhanced to a greater extent in a “simpler” language or whether there is no difference as Linkword has removed this element of difficulty. As the results suggested that no difference occurred in productive recall between “average” readers and dyslexic pupils it would be predicted that no difference would be found in recall for the two types of language, as Linkword is not based on these orthographic elements and therefore the supposed difficulty in learning German or French is removed.

Also, a further idea may be to manipulate the sound variable of the programme. For those with the strongest dyslexia the inclusion of the acoustic representation of the word may prove to be more distracting due to their phonological difficulties (Crombie, 2000). Therefore it would be interesting to see whether this was the case for this programme. The pupils could be given the choice of turning it off to see how many pupils do so, or performance could be compared for pupils with and without sound to see the affect it is having upon the pupils.

Implications of findings

The conclusions of this research should have an impact on teaching strategies on two levels. Firstly, recent discussion amongst educators has raised the issues that not enough pupils are gaining enough competence in foreign languages (Dobson, 1998) and that attitudes towards these subjects are not positive (Stables et al, 1999). The aim at present is to increase both performance and attitudes of pupils in schools. In answer to this, the Linkword programme has shown that for the “average” child in the classroom, not only is performance increased through using the programme, but the programme is more enjoyable and easier than other methods, has raised pupils confidence and motivation and influences their decisions to some extent to become more involved in language learning. As the study was based during real classroom time, the practicality and success of Linkword in a classroom situation has also been shown.

Secondly, the study has important implications for teaching dyslexic children foreign languages. Whilst it is widely recognised that dyslexic pupils are performing poorly at foreign languages using traditional methods, educators appear to fall into two main camps with regards the development of these children’s education. The one camp advocates that these pupils who are finding languages difficult should be allowed to drop the foreign language requirement and shouldn’t be “forced” into learning a subject they find difficult and not enjoyable such as the Department of Educational Standards (2002). The other camp however calls for a reform of teaching methods, with emphasis on strategies to improve pupil’s performance and therefore motivation and enjoyment of language (McColl, 1997). The results of this study come in answer to this second claim, proving that educators shouldn’t give up on the dyslexic child but instead should change their methods of teaching. Linkword leads dyslexic children to report that they enjoy using the programme to learn languages, find languages easy using the programme and find the programme easier and more enjoyable than current teaching methods. Crucially, motivation and confidence, which are documented to be

poor, are also raised. With this method of teaching pupils are not being “forced” into anything – they are enjoying using the method and gaining benefits from using it.

Educators need to recognise that teaching methods have an impact on the success of the dyslexic child in the classroom. Current, phonologically based teaching methods do not appeal to the dyslexic child due to their deficits in these areas and persevering with these techniques can only serve to further demotivate the child and lower their self-esteem. This study shows that Linkword can be incorporated into real teaching plans to allow both performance and attitudes of dyslexic children to vastly improve. As shown above, the method also has a positive affect on “average” readers as well, meaning that the method can be easily used with a mutli ability group without having to especially accommodate the dyslexic child. It is not suggested that this method take over language teaching from the teacher but that it be used perhaps for one session a week. This session can be used to build up a vocabulary base whilst the teacher can extend this knowledge during other class times with more complicated grammar, sentence structures or oral work.

As a learning strategy, Linkword has shown success both towards performance and attitudes to foreign language learning at a time where performance level has been doubted and enthusiasm is low. It has enabled both those with and without learning difficulties to expand their knowledge and reassess their opinions, motivation and confidence towards language learning. Now all that remains is for it to be accepted into the classrooms of more schools so that more children, especially those with dyslexia whose ability is under doubt, can benefit from the numerous advantages success in a foreign language can bring.

References

- Adams, M (1990) *Beginning to read. Thinking and Learning about Print.* Cambridge, MA: MIT Press.
- Atkinson, R & Raugh, M (1975) “ An application of the mnemonic keyword method to the acquisition of a Russian vocabulary” *Journal of Experimental Psychology: Human Learning and Memory*, 104, 126 - 133
- Atkinson, A (1992) “What’s the point?” *Special Children*, 53, 14 - 27
- Beaton, A., Gruneberg, M & Ellis, N (1995) “Retention of foreign vocabulary learned using the keyword method: A ten year follow up” *Second Language Research*, 11, 12 – 120.
- Bourne, R (1996) “ CD – ROM for language learning” *Studies in Modern Languages Education*, 4, 50 – 61
- Chambers, G & Sugden, D (1995) “Modern foreign languages and pupils with SEN – first steps” *Studies in Modern Foreign Languages Educaiton*, 2, 1 - 15
- Crombie, M (1995) “It’s all double Dutch” *Special children* 1995, 9 - 13
- Crombie, M (2000) “Dyslexia and the learning of a foreign language in school: Where are we going?” *Dyslexia* 6, 112 - 123
- Crombie, M & McColl H (2000) In *Multilingualism, Literacy and Dyslexia: A challenge for educators.* Eds Peer, L & Reid, G.
- Curtis, P. (2002) “Reports of curriculum changes spark anger” In *education Guardian* 8th February 2002
- Dobson, A (1998) *MFL Inspected: Reflections on inspection findings 1996/97* London: HMSO
- Downey, D, & Snyder, L (1999) “College students with dyslexia: Persistent linguistic deficits and foreign language learning”. Presentation made at the first international multilingualism and dyslexia conference, Manchester, 17 – 19 June.
- Downey, D., Snyder, L., & Hill, B (2000) “College students with dyslexia: Persistent linguistic deficits and foreign language learning” *Dyslexia*, 6, 101 - 112
- Edwards, J (1994) *The scars of dyslexia: eight case studies in emotional reactions.* London: Cassell
- Ellis, N & Beaton, A (1993) “Factors affecting the learning of foreign language vocabulary: imagery keyword mediators and phonological short term memory” *Quarterly Journal of Experimental Psychology*, 46a, 553 - 558

- Eysenck, M & Keane, M (2000) Cognitive psychology: A students Handbook. Psychology Press
- Ganschow, L & Sparks, R (2000) "Reflections on foreign language study for students with language learning problems: Research, Issues and Challenges" *Dyslexia*, 6, 87 - 100
- Ganschow, L., Sparks, R, & Javorsky, J (1998) "Foreign language learning difficulties: An historical perspective" *Journal of Learning Disabilities* 31, 248 - 258
- Grenfell, M & Harris, V (1998) "Learner strategies and the advanced language learner: Problems and processes" *Language Learning Journal* 17, 23 – 28
- Gruneberg, M (undated) Unpublished study
- Gruneberg, M (2002) Linkword computer courses. French, German, Spanish, Italian, Greek, Russian, Japanese, Portuguese, Hebrew, Dutch.
www.linkwordlanguages.com
- Gruneberg, M (1998) " A commentary on criticism of the keyword method of learning foreign languages" *Applied Cognitive Psychology*, 12, 529 - 532
- Gruneberg, M & Jacobs G (1991) "In defence of Linkword" *Language Learning Journal*, 3, 25 - 29
- Gruneberg, M & Pascoe, K (1996) "The effectiveness of the keyword method for receptive and productive foreign vocabulary learning in the elderly" *Contemporary Educational Psychology*, 21, 102 - 109
- Gruneberg, M., Sykes, R & Gillett, E (1994) "The facilitating effects of mnemonic strategies on two learning tasks in disabled adults" *Neuropsychological rehabilitation*, 4, 241 - 254
- Hogben, D & Lawson, M (1994) "Keyword and multiple elaborations strategies for vocabulary acquisition in foreign language learning" *Contemporary Educational Psychology* 19, 367 – 376.
- Hornsby, B & Sheer, F (1980) Alpha to Omega, 3rd edn. Oxford: Heinemann.
- Horwitz, E., Horwitz, M & Cope, J (1986) "Foreign language classroom anxiety" *Modern Language Journal*, 70, 125 – 132.
- Hulme, C (1981) Reading retardation and mulitsensory teaching. London: Routledge
- Humphrey, N (2002) "Teacher and pupil ratings of self esteem in developmental dyslexia" *British Journal of Special Education*, 29, 29 - 35

- Jameson, M (2000) “Dyslexic gifts – the good news” *Dyslexia Contact*, 18, 24
- Jones, D (2002) “Language learning on brink of crisis” *Times educational Supplement November 22nd 2002*
- Kaspar, L (1982) “Learning and recall strategies in the acquisition of Spanish nouns” Unpublished Masters Thesis
- Kasper, L (1993) “The keyword method and foreign vocabulary learning: A rationale for its use” *Foreign Language Annals*, 26, 244 - 251
- King – Sears, M., Mercer, C., Sindelar, P (1992) “Toward independence with keyword Mnemonics: A strategy for science vocabulary instruction” *Remedial and Special Education*, 5, 22 – 33.
- Levine, M (1987) *Developmental variation and learning disorders*. Cambridge, MA: educators publishing service
- Mastropieri, M., Scruggs, T & Fulk, B (1990) “Teaching abstract vocabulary with the key word method: effects n recall and comprehension” *Journal of Learning Disabilities*, 23, 92 - 9
- Mavrommati, T & Miles, T (2002) “A pictographic method for teaching spelling to Greek dyslexic children” *Dyslexia*, 8, 86 - 101
- Maybury, B (2002) “The effect of the keyword method on the performance levels of dyslexic and non dyslexic students” Unpublished BSc Project.
- McColl, H (1997) *Europe, language learning and special educational needs*. Edinburgh: Scottish Office Education and Industry Department
- McColl, H (2000) *Modern Foreign Languages for All*. David Fulton Publishers.
- Miles, T (1993) *Dyslexia: The pattern of difficulties*, 2nd edn. London: Whurr Publishers Limited.
- Moys (1998) *The Nuffield enquiry report*
- Mullen, I (2002) “Language Learning on brink of crisis” *Times educational Supplement November 22nd 2002*
- Myers, B & Ganschow, L (1988) Profiles of frustration: second language learners with specific learning difficulties. In J.F. Lalande II. (ed.) *Shaping the future foreign language education: FLES, articulation and proficiency: selected from the 1988 central states conference*, pp 32 – 53. Lincolnwood, IL: national textbook
- Nunan, D (1995) “Closing the gap between learning and instruction” *TESOL Quarterly* 29, 133 - 158

- Stables, A & Wilkeley, F (1999) "From bad to worse? Pupil's attitudes to modern foreign languages at ages 14 and 15" *Language Learning Journal* 20, 27 – 31
- Thomas, M & Wang, A (1996) "Learning by the Keyword mnemonic: Looking for long term benefits" *Journal of Experimental Psychology: Applied*, 4, 330 – 342
- Vellutino, F & Scanlon, D (1986) Linguistic coding and metalinguistic awareness: their relationship to verbal and code acquisition in poor and normal readers. In D. Yaden & S. Templeton (eds) *Metalinguistic awareness and beginning literacy* (pp. 115 – 141) Portsmouth, NH: Heinemann.
- Vitale, B (1982) *Unicorns are real: A right brained approach to Learning*. California: Jalmar Press
- Wilkins, A (1996) "Dyslexia helping reading with colour" *Dyslexia Review*, 7, 4 – 7