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EFFECTS OF REMEDIATION
ON SPELLING ACHIEVEMENT
OF PRIMARY SCHOOL AGED
CHILDREN WITH
LEARNING DIFFICULTIES

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Psalm 23:1

- * Morena ke modisa wa me, ga nkitla ke tlhoka sepe.
(Setswana).
- * The Lord is my shepherd; I have everything I need.
(English).

ZIMELA THERESA BAARTMAN

DECLARATION



I declare that "effects of remediation on spelling achievement of primary school aged children with learning difficulties" is my work. It is being submitted for the award of Master of Education degree to the University of the North West. It has not been submitted before, for any degree or examination.

ZIMELA THERESA BAARTMAN

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	i
ABSTRACT	x
CHAPTER ONE	1
1. INTRODUCTION	1
1.1 STATEMENT OF THE PROBLEM	1
1.2 PURPOSE OF THE STUDY	5
1.3 RESEARCH HYPOTHESES	6
1.4 METHOD OF RESEARCH	7
1.5 DEFINITION OF TERMS	7
1.5.1 Remediation	7
1.5.2 Learning disability	7
1.5.3 Gender differences	8
1.5.4 Socioeconomic status	8
1.5.5 Primary School Aged Children	9
1.6 DESIGN OF STUDY	9
1.7 SIGNIFICANCE OF STUDY	9
1.8 SUMMARY	10

CHAPTER TWO 13

2.	REVIEW OF LITERATURE	13
2.1	EFFECTIVENESS OF REMEDIATION	13
2.2	EFFECTS OF REMEDIATION ON SPELLING ACHIEVEMENT	18
2.3	GENDER VARIATION IN PRIMARY SCHOOL CHILDREN WITH LEARNING DIFFICULTIES	20
2.4	INFLUENCE OF SOCIOECONOMIC STATUS ON LEARNING DISABILITY	22
2.5	SUMMARY	26

CHAPTER THREE 28

3.	METHOD	28
3.1	INTRODUCTION	28
3.2	RESEARCH HYPOTHESES	28
3.3	PILOT STUDY	29
3.3.1	Why was the Pilot Study done?	29
3.3.2	Population	30
3.3.3	Subjects	30
3.3.4	Variables Studied	31
3.3.5	Instruments	31
3.3.5.1	Spelling Test	31

3.3.5.2	Socioeconomic Background	
	Questionnaire	31
3.3.5.3	Remediation	32
3.3.6	Procedure	33
3.3.7	Analysis of Data	34
3.3.7.1	Hypothesis One	35
3.3.7.2	Hypothesis Two	35
3.3.7.3	Hypothesis Three	36
3.3.7.4	Hypothesis Four	37
3.3.7.5	Hypothesis Five	39

CHAPTER FOUR 41

4.	MAIN STUDY	41
4.1	AIM OF RESEARCH	42
4.2	POPULATION	42
4.3	SUBJECTS	42
4.4	VARIABLES STUDIED, INSTRUMENTS AND PROCEDURES	43
4.5	ANALYSIS OF DATA	43
4.6	DISCUSSION OF RESULTS	48
4.6.1	Effects of Remediation on Spelling achievement of Standard Four Children	48
4.6.2	Amount of Remediation and improvement in Spelling Achievement	48

4.6.3	Gender difference in English Spelling Ability in react- ion to Remediation	49
4.6.4	The association between Socioeconomic background and English Spelling Ability	50

<i>CHAPTER FIVE</i>	52
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5.	SUMMARY AND CONCLUSIONS	52
5.1	MAIN OBJECTIVE OF THE STUDY	52
5.2	REVIEW OF LITERATURE	52
5.3	METHODS OF RESEARCH	52
5.3.1	Subjects	53
5.3.2	Instruments	53
5.3.3	Analysis of Data	53
5.4	RESULTS	54
5.5	LIMITATIONS	54
5.6	RECOMMENDATIONS	55

	PAGE
REFERENCES	57
APPENDIX A	66
APPENDIX B	69
APPENDIX C	73

LIST OF TABLES

		PAGE
TABLE 3.1	POSTTEST I: MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	36
TABLE 3.2	POSTTEST II: MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	37
TABLE 3.3	MEAN SCORES, STANDARD DEVIATIONS AND T VALUES	37
TABLE 3.4	MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	38
TABLE 3.5	MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	39
TABLE 4.1	POSTTEST I: MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	44
TABLE 4.2	POSTTEST II: MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	45
TABLE 4.3	MEAN SCORES, STANDARD DEVIATIONS AND T VALUES	46
TABLE 4.4	MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	47
TABLE 4.5	MEAN GAIN SCORES, STANDARD DEVIATIONS AND T VALUES	47

ABSTRACT

The purpose of this study was to examine effects of remediation, amount of remediation, socioeconomic status, and gender variations on English spelling achievement of standard four pupils in the Lehurutshe area of the North West Province.



The review of relevant literature led the researcher to believe that remediation, amount of remediation, socioeconomic status and gender variations are the variables which are generally associated with academic achievement of primary school pupils and these are also related to their English spelling achievement. For this study, it was hypothesized that the said variables would be significantly associated with English spelling achievement of primary school children in the Lehurutshe area of the North West.

A sample of 90 (ninety) subjects was chosen from two schools where standard four pupils were being educated in Lehurutshe. These schools were located in the same vicinity. However, they catered for a diversity of family backgrounds. An experimental design was employed to examine the effects of remediation and the amount of remediation on spelling achievement. A standardized spelling test was chosen to take measures

of English spelling achievement at the stages of pre-testing and posttesting. The subjects also completed a socioeconomic background questionnaire to take estimates of their socioeconomic status.

Two experimental studies were designed: the pilot study and the main study. The data of these studies were analysed to test the following hypotheses:

- H1: There is a significant positive relationship between English spelling scores of primary school aged children and remediation arranged to improve their English spelling ability.
- H2: There is a significant association between the amount of remediation and spelling ability of primary school aged children.
- H3: There are significant gender differences in spelling ability of primary school aged children.
- H4: There are no significant gender differences in reacting to remediation treatment.
- H5: Primary school aged children with spelling difficulties and belonging to high socioeconomic strata benefit significantly more than those with a low socioeconomic background.

It was found that: (a) the remedial treatment improves the English spelling ability, (b) the experimental groups that received more remedial treatment than the other experimental groups did not demonstrate significantly higher improvement in the spelling ability, (c) there were no significant gender differences in spelling achievements and in reacting to remedial treatment, and (d) the variable of socioeconomic background did not significantly associate with English spelling achievement.

CHAPTER ONE

1. INTRODUCTION

1.1 *Statement of the Problem*

With the establishment of the Mmabana cultural centre in the then Republic of Bophuthatswana, one of the activities catered for was remedial education. The monthly reports that were submitted to management indicated that a great number of pupils in primary and middle schools had learning problems. Teachers in these schools did not hesitate to label such children as stupid and also classify them in the lowest grouping of the class eg. Standard 5E.

Labels, as stated by Johnson and Myklebust (1967:49), have adverse effects on continuous learning, self perception and feeling of personal worth. Mabunda (1986:35) also reported that children labelled "lazy, slow, fool", et cetera, were ultimately deprived of all educational services because their problems precluded them from securing a place in a school. The attitudes of teachers to labelled children were often negative. Consequently, little effort was made in imparting knowledge to them. In most cases such children had been unable to cope with the curriculum.

This, according to Mabunda (1986), made the specific learning disabled child the "step child" of the education system.

According to the Lekhela Commission (1978:39), children who have learning difficulties at school tend to leave school prematurely and they do not achieve what they are capable of in relation to their abilities. There was a shift from the stage of neglect of learning disabled children to the grouping together of children with general learning difficulties and those with specific learning difficulties (Montgomery 1990:176). These children were all offered the so-called "remedial" tuition or they were taught in segregated groups for part of the school week. Mabunda (1986:36) indicated that for remediation to be successful proper diagnostic procedures need to be followed prior to the drawing up and implementation of an individual education plan.

Wallace and McLoughlin (1979:7-8) stated that the child with learning difficulties appears normal in every respect except for the fact that his or her learning difficulties limit his or her progress in school. Many children have to demonstrate repeatedly that they are experiencing serious problems before anything is done (Leach and Raybould 1977:146). Identification of potential difficulties has to be done

at an early stage before feelings of failure and negative attitudes occur. Lerner (1985:4) reported that learning disabilities manifest themselves through lack of achievement in learning to read, spell, write and also in arithmetic and mathematics.

Early identification of learning difficulties and their speedy correction is of the utmost importance as maintained by Westwood (1975:1) and Young and Tyre (1983:136). These authors suggest that early intervention, before children experience prolonged periods of educational failure, would save them from perpetual dependency. It would be more useful if teachers were aware of these manifestations for they could show concern. Nevertheless they would require administrative support. Leach and Raybould (1977:146) state that lack of this support hinders early and effective intervention.



Earlier researchers (Bryant 1972) as cited by Wallace and McLoughlin (1979:197) indicated that a spelling problem is usually an indication of a language disability rather than a reading one. Woolfolk (1987:394) also maintained that spelling difficulties, though held to be one characteristic of dyslexia, are generally considered as an indication of a specific language difficulty. She further stated that some authors suggest that an error rate of 10 per cent of

written output constitutes a spelling difficulty severe enough to justify special action. Todd (1982:vii) pointed out that spelling is probably one of the worst taught subjects in our schools today. This, he said, had not been the teachers' fault but rather spelling itself had not been considered significant until fairly recently.

Spelling difficulties are sometimes present in people with an apparently normal or even superior reading ability (Todd 1982:95 and Jorm 1983:95). One sometimes sees a specific problem of this kind in university students and it can be a serious disadvantage to them in writing essays and examination papers. Todd went on to say that teaching of spelling appears to be an ad hoc activity in most schools. She posed the following questions:

1. How many schools allocate definite time for the teaching of spelling? By this she meant teaching, and not the ritual testing of spelling which takes place in many schools each Friday morning.
2. How many schools allocate resources for spelling?
3. How many schools give teachers the responsibility to co-ordinate the teaching of spelling in their schools?

The problem of spelling as stated by Henderson (1990:189) stems from the fact that teachers no longer teach children to spell. They are so permissive that they let pupils spell any way they please. No wonder students cannot spell correctly!

Recent trends in special education favoured mainstreaming, that is keeping children with special needs in regular classrooms as much as possible (Seifert 1983:267). This trend implies that a teacher in the normal classroom is to be in a position to handle special needs of children. In all earnest this had not been feasible mainly because teachers themselves were not equipped to handle such tasks.

The present study was aimed at exploring:

- a) the relationship between spelling achievement of primary school aged children and remediation.
- b) the effects of socioeconomic status on spelling achievement, and
- c) the gender variations in spelling achievement of children who are remediated.

1.2 *Purpose of the Study*

The main purpose of this study was to determine whether the following variables influence spelling achievements of Std IV pupils in the Welbedacht area of Lehurutshe, North West: remediation, amount of remediation, socioeconomic status and gender.

1.3 *Research Hypotheses*

Hypothesis One

There is a significant positive relationship between English spelling scores of primary school aged children and remediation arranged to improve their English spelling ability.

Hypothesis Two

There is a significant association between the amount of remediation and spelling ability of primary school aged children.

Hypothesis Three

There are significant gender differences in spelling ability of primary school aged children.

Hypothesis Four

There are no significant gender differences in reacting to remediation treatment.

Hypothesis Five

Primary school aged children with spelling difficulties and belonging to high socioeconomic strata benefit significantly more than those with a low socioeconomic background.

1.4 Method of Research

There were two stages in this investigation:

(i) the pilot study and (ii) the main study.

At the pilot study stage, the instruments and experimental treatments were tried. If there was need for any improvement, the remediation methods for the main study were modified.

1.5 Definition of Terms

1.5.1 Remediation refers to the process of preventing, investigating and treating learning difficulties from whatever source they may emanate (Gains & McNicholas 1979:181 in Van Wyk and du Toit 1981:20).

1.5.2 Learning disability as defined by Lerner,

(1989:8) is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning and mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g. sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (e.g. cultural differences, or inappropriate instruction, psycholinguistic factors); it is not the direct result of those conditions.

1.5.3 Gender differences: For this study, these are to refer to differences in English Spelling achievement of boys and girls.

1.5.4 Socioeconomic status: It refers to the level of education attained by both parents, their occupation, family income, the value of the home, and the specific facilities and economic goods in the home, such as television, radio and typewriters, etc.

(Woolfolk 1987).

1.5.5 Primary School Aged Children: For this study, primary school aged children were those children who were attending primary schools.

1.6 *Design of Study*

The dependant variable in this study was spelling achievement while there were four independent variables: remediation, amount of remediation, gender and socioeconomic status.

1.7 *Significance of Study*

This investigation will assist teachers and educational administrators in the North West region to understand whether or not spelling achievement of primary school aged children with learning difficulties is associated with remediation, amount of remediation, gender and socioeconomic background of primary school children. If it is proven that the above mentioned four independent variables affect English Spelling achievement of primary school children with learning difficulties, teachers would be able to gain some understanding about their pupils and employ some remedial approaches to enhance the level of their

achievement.

1.8 *Summary*

In this chapter, it came out clearly that children with learning difficulties are found in normal schools. Such children are labelled "lazy, slow, fools" et cetera and this has been found to have adverse effects on their learning, self-perception and feelings of personal worth.

Generally speaking a child with learning difficulties appears normal in other respects except for the fact that his or her learning difficulties limit his or her progress at school. Teachers, according to Reid and Hresko (1981:105), display a negative attitude toward learning of disabled children and thus little efforts are made in imparting knowledge to them.

According to the findings of the Lekhela Commission (1978), children with learning problems got little attention at school and this made them to leave school prematurely. Recent research indicated a shift from the stage of neglect of these children to that of grouping them together. Remediation was then offered to such children for part of the school week.

Concern about many children having shown repeatedly

that they are experiencing serious problems before anything was being done was raised (Leach and Raybould, 1977). Early identification and speedy correction, according to Westwood (1975), is of utmost importance. Lerner (1985) concurred with Westwood and reported that learning disabilities manifest themselves through lack of achievement in learning to read, spell, write and also in arithmetic and mathematics.

Teachers who are directly involved with imparting knowledge to the pupils at school would do well if they were aware of the manifestation of learning disabilities in children. Lack of achievement at school should be taken seriously and spelling problems are usually an indication of language disabilities rather than reading problems (Wallace and McLoughlin: 1979).

Spelling difficulties had been realised even among university students and had resulted in a great disadvantage when writing essays and examination papers. Recently, trends in special education, favoured mainstreaming, that is keeping children with special needs in regular classrooms as much as possible (Seifert 1983). This implies that a teacher in the normal classroom is to be in a position to handle needs of learning disabled children.

For teachers to deal successfully with special needs of their pupils, they need to be equipped with certain necessary skills. This investigation focused on children with learning difficulties at school. An attempt was made to see if remediation in spellings, amount of remediation, socioeconomic background and gender are in some ways associated with spelling achievement of primary school children.

CHAPTER TWO

2. REVIEW OF LITERATURE

In this investigation effects of remediation, amount of remediation, socioeconomic status and gender on spelling achievement of primary school children were examined. The review of related literature focused on both theoretical ideas of theorists and experimental works of other researchers in relation to the above four independent variables and their effects on the dependent variable.

2.1 Effectiveness of Remediation



It is a known fact that children with learning problems exist and that these problems can be attributed to a variety of causes linked to the child's individual potential or his/her home and didactic situation. Surprisingly there is a general neglect concerning the identification of the source and an attempt to deal with the problem as manifested. Nevertheless, remedial services need to be considered seriously for they are concerned with the prevention, investigation, and treatment of learning difficulties from whatever source they may emanate which hinder the educational development of the student (Kapp 1991:53).

Johnson and Myklebust (1967:49) maintained that proper programming is of benefit to society, as well as to the individual. They went on to say that if these children remain in regular classes without special education, they often become school drop-outs, become dependent throughout their adult years with a protracted drain on the economy. Should the programmes be established and followed by appropriate remediation, the majority become independent and self supporting. To label pupils at times has a positive effect in that the problem can be identified and help can be given by providing a remedial programme unique to an individual (Mwamwenda 1989:320). Furthermore Kapp (1991:143) emphasises prevention of learning problems through effective instruction. This instruction should consider particular circumstances and needs of individual pupils must be given top priority.

Young and Tyre (1983:136) pointed out that children with deficiencies in cognition could be helped through remediation. They further said that even if these children could not attain expected standards they would definitely progress at their own pace and achieve something according to their capabilities. Westwood (1975) was the first reading specialist to recognise the fact that if a child has a specific weakness in reading, he/she is likely to persist for

a very long time unless something is done to remedy the fault and fill the gaps in the child's knowledge.

Suran and Rizzo (1979:275) emphasized the fact that individualized instruction with a learning disabled child frequently produces rapid improvement in areas of academic deficiency. They further stated that once the nature of the child's disability has been identified teachers can more confidently program instruction to meet the child's needs. In support of this, Gresse (1990:28) clearly stated that remedial drills become effective when practised regularly; short drills, when utilized, serve a purpose, students should be aware of the specific aim of each drill, and they should be conducted under supervision with a set limit.

In the HSRC report (1981:179) cited by Kapp (1991:54) it is envisaged that remediation will have to be implemented or planned by remedial teachers in primary schools and by guidance teachers in secondary schools. In this report it is further stated that in primary and secondary schools, class and subject teachers should possess the basic knowledge and skills to be able to identify the child who needs remedial help, and also to plan and implement remedial procedures under the guidance of the remedial teacher or the guidance teacher.

Balow, as cited by Silberg and Silberg (1969:210) reported on a study dealing with reading growth of children who are given two hours of daily reading remediation for a five week period. The group gained five school months in reading. It should be borne in mind that remediation aims at correcting defects and the focus is typically on the correction of a specific deficit such as reading, spelling and writing. These authors (ibid) suggested that children subjected to remediation, such as remedial reading, show short term positive effects.

Recently Montgomery (1990:178) maintained that pupils with specific learning difficulties and at least average abilities could profit from a remediation tutorial programme. This needs to be logical, structural and sequential and the tuition is given by a trained teacher. When such specialist remedial tuition is given to no more than pairs of children at a time on two or three occasions per week, pupils can be brought back up to at least their age level within six months to two years.

Johnson and Myklebust (1967:309) reported on progress made by children who began training during pre-school years. Eighty five children enrolled in their training programme and in the local schools were evaluated to determine the need for special education to be

continued. Some were dismissed after kindergarten because they required no further help; others were placed in special programmes as follows:

15 remained in the regular class - no further remediation necessary.

41 remained in the regular class, but required supplemental assistance.

18 required special class placement.

11 required placement in a special school.

In another study Johnson & Myklebust (1967:310-311) reported that 60 dyslexics were found to have a social quotient of 86,1. Their mean intelligence quotient was 101,3, the mean oral reading quotient 77,6 and the reading vocabulary quotient 80,3. Of these 60 children, 16 were evaluated again after one year of remedial education. There was an average gain in reading vocabulary of 1,9 grades. In spelling it was 1,3 grades.

Ross (1976:110) reports on the study of three groups of children who did not differ on either the test quotient or the qualitative score when tested before any training was effected them. Two groups served as an experimental group and they were taught. After completion of training the means of the experimental groups' qualitative errors was significantly lower

than the control group, while their test quotient was significantly higher. Long term effects of remedial education on children who were taught individually in child guidance clinics or in small groups at their own schools showed improvement in both groups (Galloway & Goodwin 1987:68). Pringle (1961) and Shearer (1967) as quoted by Galloway & Goodwin (1987) concurred with the idea that remedial teaching produced good educational progress and social adjustment.

2.2 *Effects of Remediation on Spelling Achievement*

Researchers, Bailet and Lyon (1985:163), administered two spelling tasks to test the hypothesis that spelling performance would improve when given implicit cues regarding word meaning relationships upon which morphophonemic - morphographic rule usage is based. Interestingly the greatest improvements occurred not only in spelling of suffixes, but also in the base words. Of the 12 isolated base words dictated in Task Two, the speller got 10 or 83 % correctly. In contrast, he or she spelled only 50 % of the base components accurately for words in Task One. For those inflected and derived words in Task Two he or she achieved 75 % accuracy on the base word component.

Gerber (1986:533) investigated the method of correcting spelling error during instruction. He studied

Jobe's work done in 1975 which demonstrated that modelling correct spelling with contingent corrective feedback was successful not only in improving the spelling performance of target learning disabled students, but also in influencing the performance of learning disabled students who passively observed effects of training procedures on target subjects.

A report by Jimenez and Rumeau (1989:195-198) maintains that several studies have suggested the importance of whole language experiences in writing instruction especially in learning to spell. It goes on to say that some authors suggest that phonic instruction is superior to instruction emphasizing meaning. However, as learning progresses, fewer errors are shown with global method compared to the phonic method. In the Bullock Report (1975) quoted by Todd (1982:VII) it is explicitly stated that schools have a responsibility to teach their pupils correct spelling. However we are still faced with the problem of how to teach spelling effectively.

Westwood (1987:99) stated that for many low achieving students spelling continues to present a problem long after reading skills have improved. At times this is due to the fact that spelling is not made an integral part of the initial remedial reading programme. In support of this, Peters (1985:28) reports that spell-

ing might be partly picked up by listening especially in the case of words that have no possible alternatives. She further stated that words that sound the same, but spelled differently depend upon grammar and meaning if they are to be spelled correctly.

2.3 Gender Variation in Primary School children with Learning difficulties

Cruickshank (1977:22-25) pointed out that there is a greater number of boys than girls who are counted in schools as learning disabled children. In fact no accurate census exists on the number of learning disabled children, nor in the percentage which they represent in the known childhood population. The fact stands that, as of now, no accurate count is available. However, all reports indicate a higher percentage of boys than girls. He further reports that in his study it was impossible, out of a large population of school children, to find a fourth girl at the elementary age to match with three other girls. In another pupil school system, the ratio of learning disabled boys to girls was approximately 25 to 1. In still another system 15 to 1. Male learning disabled children then, apparently, are in such greater abundance in the childhood population.

According to Jorm (1983:11) sex differences in inci-

dence studies of poor readers referred to clinics have consistently found that males are seen much more frequently than females. This gender difference has been reported to hold in every country where it has been studied. Furthermore he pointed out that epidemiological studies show a similar sex difference. For example, the Isle of Wight study found that 77 per cent of children with specific reading retardation were boys and only 23 per cent were girls. He also found that 54 per cent of children with general reading backwardness were boys. Eisenberg (1966) as quoted by Koransky (1972) drew a similar conclusion in indicating that the number of retarded readers amongst boys (19,5 per cent) was more than twice as high as that for girls (9,0 per cent).

Durrant (1994:27) maintains that gender was reported in the majority of studies. Of these 12 per cent used samples that did not include girls. He further states that the literature regarding gender differences in the incidence of the learning disabled indicates that the male to female ratio is approximately 4 to 1. This ratio was met in 8 per cent of cases. Females made up more than one fourth of the sample in 60 per cent of studies and less than one fourth of the sample in 32 per cent of studies. Contrary to the foregoing authors Woolfolk (1987:45) differed from them by arguing that the overall IQ scores of males and

females are not significantly different on average.

2.4 Influence of Socioeconomic status on learning disability

Academic achievement is strongly associated with environmental factors. This embraces size of the family, social class and material circumstances. Parents' reading habits and the books at the home may have some relationship with remediation.

Woolfolk (1987:126) suggested that the most important socioeconomic status variable with regard to the child's achievement in learning, is probably the level of education attained by parents of the child. There is a general concordance from many sources, as cited by Koransky (1972:11), in the literature that children from lower socioeconomic environment have a higher incidence of reading disabilities than do children from higher socioeconomic environment. Woolfolk (1987) further emphasized that it is well documented that higher socioeconomic status students of all ethnic groups tend to show higher average levels of academic achievements than lower socioeconomic status students.

In another study cited by Haring & Bateman (1977:141), evidence provided suggested that children from lower

class families tended to show a decline in their progress at school in the middle primary years. Leach & Raybould (1977:146) reported that an unpublished survey of 1,168 seven year olds in a predominantly rural area revealed variations of 0 to 25 per cent for reading difficulties, and 0 to 51 per cent for spelling difficulties. Woolfolk (1987) stated that the correlation between socioeconomic status and learning in sixth grade is about 0,50. Parents of high and middle class status tend to hold a positive attitude toward schooling, which they pass on to their children. This attitude is very essential to stimulate children with learning difficulties. (Laosa 1982 as quoted by Woolfolk 1987:126).

Ross (1976:90) maintains that children with poor reproductive histories who are raised in economically deprived families, or whose mothers had a poor education or psychological disorders, tend to be intellectually retarded when they are tested at school age. On the contrary children with the same reproductive complications who are raised in an advantaged environment, appear to overcome whatever difficulties may be associated with their birth history, so that by school age they do not appear different from children whose perinatal experience was eventful.

Children who have repeatedly encountered wrong rein-

forcement in the past are less likely to learn under conditions of reinforcement than those who have been used to being regularly reinforced for behaviour deemed correct by their environment. Ross (1976:23) further concluded that children with limited experience with reinforcement and low expectations of success were operating under a handicap compared to those whose environment had taught them that their responses were frequently correct and that correct responses were usually followed by reward. These differences in environments tend to be correct.

To explain middle class phenomenon, Ross (1977:43) puts it as; a child whose parents know enough not to accept the dullness explanation for their child's poor school performance. Parents who have the motivation and financial resources that will ultimately result in the identification of a learning disability. In other words we are talking about the child of middle class parents, who take an interest in his/her education and who have the wherewithal to see to it that their child's interests are being served.

There are some studies (Pretorius 1979:171) as cited by Kapp (1991:30) which maintain that poor socioeconomic circumstances and an environment which is culturally poor and lacks opportunities may hamper the child's development and learning to such an extent

that his/her potential cannot develop fully. They further stated that some children grow up in good homes, under sound economic circumstances and receive adequate didactical guidance, but nevertheless develop learning and behaviour problems at school owing to adverse influences from their own subculture and peers.

Recently, Kapp (1991:297) stated that research shows that parents from the lower income groups maintain an educational style which is not beneficial to the development of the child's cognitive skills. They explain less and act more; they expect obedience without offering a reason for it; they are impulsive and act on the basis of their emotions rather than on logical reasoning, they do not encourage the child to think, to substantiate his choices or to make his own decisions, et cetera. Parents from the lower income groups often have an attitude of helplessness and a resignation to their inability to improve their situation by themselves. The same lack of motivation is evident in scholastic achievement and parents often do not give their children the required encouragement, help and guidance concerning schoolwork.

Haring and Bateman (1977:147) reported that much had been learnt from longitudinal research studies about the relationship between children's response to

schooling and factors in their home background. Parents of high and middle class status tend to hold a positive attitude toward schooling, which they pass on to their children (Woolfolk 1987:26). Montgomery (1990:173) drew similar conclusions in indicating that socioeconomically disadvantaged children may be particularly deprived of experiences with print and with the more formal uses of language.

The hypothesis (see paragraph 1.3 and 1.4) that there is a relationship between remediation and spelling abilities of primary school aged children with learning difficulties can thus be accepted, on the strength of the review of the literature. Students remediated ought to be better achievers than students who are not remediated.

2.5 *Summary*

From the foregoing discussion it is without doubt obvious that remedial services need to be considered seriously for they are concerned with the prevention, investigation and treatment of learning difficulties from whatever source they may originate.

It should be pointed out that individualized instruction with a learning disabled child frequently produces rapid improvement in areas of academic

deficiency. Once the nature of the child's disability has been identified, a programme of instruction unique to the individual's needs can be drawn up and implemented.

Research has been done and has proven that remediation is effective and above all when specialist remedial tuition is given to no more than pairs of children at a time on two or three occasions per week, pupils can be brought back up to at least their age level within six months to two years.

Gender differences amongst boys and girls has not been scientifically proven, however reports have indicated a higher percentage of learning disability amongst boys than girls in every country where it has been studied. This variable in incidence studies of poor readers referred to clinics have consistently revealed that males were seen much more frequently than females.

The child's socioeconomic background contributes a lot to his achievement. Here the level of education attained by parents of the child plays the most important role. Studies in this field had established that higher socioeconomic status students of all ethnic groups tend to show higher average levels of academic achievements than lower socioeconomic status students.

CHAPTER THREE

3. METHOD

3.1 The present study was an attempt to determine whether remediation and its amount, socioeconomic status and gender influence English spelling achievement of standard 4 pupils in the Welbedacht area of Lehurutshe, North West Province.

3.2 Research Hypotheses

Hypothesis One

There is a significant positive relationship between English spelling scores of primary school aged children and remediation arranged to improve their English spelling ability.

Hypothesis Two

There is a significant association between the amount of remediation and spelling ability of primary school aged children.

Hypothesis Three

There are significant differences amongst the sexes in spelling ability of primary school aged children.

Hypothesis Four

There are no significant differences amongst the sexes in reacting to remediation treatment.

Hypothesis Five

Primary school aged children with spelling difficulties and belonging to high socioeconomic strata benefit significantly more than those with a low socioeconomic background.

3.3 Pilot Study

This investigation was carried out in two stages: the pilot study and the main study. The description of the pilot study is given in this chapter.

3.3.1 Why was the Pilot Study done?

At this stage, the investigator wanted to try the instruments and experimental treatments (remediation). Treatment here refers to special tuition in spelling and reading. The duration of remediation for the pilot study was eight consecutive weeks and it com-

prised special tuition for thirty (30) minutes per week to one group of children and special tuition for sixty (60) minutes per week to another group. The researcher intended to see if there was any need to modify the measuring instruments and the treatment methods.

3.3.2 *Population*

In the Welbedacht area of Lehurutshe, there are two primary schools. All the standard four pupils of School One, who participated in the pilot study, constituted the population of the study. The total number was 56. The assumption was made that the norms, as found in the school, would be fairly representative of the general norms in the North West province of South Africa.

3.3.3 *Subjects*

All the standard four pupils at Babuseng Primary school took part in the pilot study. Their ages varied between ten and sixteen years. For pretesting purposes, the subjects were given the University of Cape Town Test of Spelling ability. This test was devised by Grover in 1986 to determine the spelling ability of children attending a guidance clinic in Cape Town. The subjects whose scores on the test were

on the lower side were assumed to have spelling difficulties due to a variety of reasons. On the basis of the pretest scores, the subjects were randomly divided into three groups: two experimental groups and one control group.

3.3.4 *Variables Studied*

The five hypotheses of this investigation demanded the researcher to focus on the following variables: remediation, amount of remediation, gender and socioeconomic status.

3.3.5 *Instruments*

3.3.5.1 *Spelling Test*

As the name indicates it is a spelling test that has been devised by Grover (1986) who used the test with the Child Guidance Clinic students at the University of Cape Town (UCT). The test was administered to the subjects for both pretesting and posttesting purposes. For the full details of the spelling test, see Appendix "A".

3.3.5.2 *Socioeconomic Background Questionnaire*

Maqsud (1993) constructed a short Socioeconomic

Background Questionnaire (SBQ), which requires the subjects to give information as to their parents' educational and occupational backgrounds as well as some economic facilities available at home. For the full details of the questionnaire, see Section B, Appendix A.

Maqsud suggested the ways to quantify the data, and his procedure was used by the researcher in order to quantify the information provided by the subjects of this study. For scoring procedure, see Appendix B. The minimum and maximum scores on the SBQ could be 4 and 27, respectively.

3.3.5.3 Remediation

The investigator taught English spelling to the two experimental groups for eight consecutive weeks and administered the spelling test at intervals of four weeks. Responses from the pretest revealed mistakes that could be attributed to omissions, insertions, reversals and phonetic spellings. Some examples of the mistakes made by the subjects are given below.

OMISSION

smok instead of smoke
rais instead of raise
toch instead of touch

INSERTIONS

ongly for only
allready for already
eyellow for yellow

Another set of mistakes could be said to result from:

REVERSALS

tabel for table
screap for scrape
ansewr for answer

PHONETIC SPELLINGS

boks for box
dun for done
ruf for rough

From the mistakes identified in the pretesting, the method of look-cover-write- and -check advocated by Peters (1967) was employed to improve the subjects' spelling achievement.

3.3.6 *Procedure*

The investigator used grammar books, blackboard, newspaper cuttings, games and a tape recorder to teach English spelling. The researcher obtained permission from the school principal and was also given full co-operation, especially when pupils were trying to play truant. Together with the English teacher, the researcher organised suitable afternoons for teaching pupils.

The teacher assisted the researcher during the pretesting phase and thereafter the investigator was left to conduct classes and administer spelling tests without any interruptions. After each test, the researcher locked up the spelling test and the pupils were not given their scripts at any point. All this was done to curb accessibility to the test which could

have led to the memorization of the words.

Lesson plans were prepared on various topics for purposes of treatment. For spelling mistakes like insertion, the look-cover-write- and -check method was employed in the manner indicated below:

1. Problem area: Insertion (adding unnecessary letters to the word).
2. Objective : To ensure that unnecessary letters are not added to a word.
3. Aids: blackboard, duster, list of words.
4. Strategies/Method: The teacher/researcher wrote a word on the blackboard from the list used. The subjects were given ample time to look at the word in order to remember the details of it. The word was then covered, so that it could not be seen. The subjects were asked to write the word from memory, pronouncing it quietly as they wrote it. Lastly, the subjects were instructed to check their version of the word against the original. If incorrect, the whole procedure was repeated until the word was spelt correctly. The above method was suggested by Westwood (1987:99-100).

3.3.7 Analysis of data

The pre- and posttesting English Spelling scores for the three groups as well as their socioeconomic background scores are given in Appendix C. The data were analyzed to test the five hypotheses of the study.

3.3.7.1 *Hypothesis One*

There is a significant positive relationship between English spelling scores of primary school aged children and remediation arranged to improve their English spelling ability.

3.3.7.2 *Hypothesis Two*

There is a significant association between the amount of remediation and spelling ability of primary school aged children.

In order to test the above two hypotheses, the English spelling scores on Posttest I and Posttest II for Groups A, B and C were compared by applying a t-test. Table 3.1 gives the mean gain scores (posttest score minus pretest score) in relation to Posttest I together with standard deviations and t values, while Table 3.2 provides the mean gain scores in relation to Posttest II. The data in these two tables lead us to hold that the mean gain scores for Groups A and B are significantly higher than that for Group C. The mean

gain scores of Group B on Posttest I is not significantly higher than that of Group A, but the mean gain scores of Group A on Posttest II is significantly higher than that of Group B.

TABLE 3.1

Posttest I: Mean gain scores, standard deviations and t values.

GROUP	N	MEAN	SD	MEAN DIFF	t
A	13	7,62	2,99	-2,07	-1,50
B	13	9,69	3,99		
A	13	7,62	2,99	2,93	*2,54
C	13	4,69	2,89		
B	13	9,69	3,99	5,00	**3,69
C	13	4,69	2,89		

*p <0,05

** p <0,01

3.3.7.3 Hypothesis Three

There are significant differences between the sexes in spelling ability of primary school aged children. The mean pretesting scores of seventeen boys and twenty two girls from a Standard 4 class are given in Table 3.3.

The mean scores were compared by using a t-test. The t value ($t=0,38$, $df=37$) did not show any significant differences between the sexes.

TABLE 3.2

Posttest II: Mean gain scores, standard deviations and t values.

GROUP	N	MEAN	SD	MEAN DIFF	t
A	13	13,54	4,16	-5,08	*3,37
B	13	8,46	3,76		
A	13	13,54	4,16	10,39	**8,49
C	13	3,15	1,46		
B	13	8,46	3,76	5,31	**4,75
C	13	3,15	1,46		
*p <0,05			**p <0,01		

TABLE 3.3

Mean scores, standard deviations and t values.

GROUP	N	MEAN	SD	MEAN DIFF	t
BOYS	17	10,06	3,94	0,38	0,33
GIRLS	22	9,68	3,23		

3.3.7.4 Hypothesis Four

There are no significant differences amongst the sexes in reacting to remediation treatment.

Table 3.4 gives mean gain scores on posttesting. Group A and Group B were given two posttests and the mean gain English spelling scores were computed. The Group A received remediation treatment for thirty minutes per week and Group B for sixty minutes per week. This treatment lasted for eight consecutive weeks. At the end of the eighth week, the researcher gave Post-test II to the groups. Mean gain scores of boys and girls within the same group were compared.

TABLE 3.4

Mean gain scores, standard deviation and t values

	GROUP	SEX	N	MEAN	SD	MEAN DIFF	t
POST- TEST I	A	B	4	9,75	3,40	3,08	1,89
		G	9	6,67	2,39		
POST- TEST II	B	B	6	8,00	4,57	-3,14	-1,49
		G	7	11,14	3,02		
POST- TEST II	A	B	4	11,25	4,11	-3,31	-1,37
		G	9	14,56	3,97		
POST- TEST II	B	B	6	7,83	3,87	-1,17	-0,54
		G	7	9,00	3,87		

From the figural details in Table 3.4 the mean gain scores of boys and girls did not show any significant gender differences.

TABLE 3.5

Mean gain scores, standard deviations and t values

	HIGH (N=13)		LOW (N=13)		MEAN	t
	$\bar{x}$	SD	$\bar{x}$	SD	DIFF	
POST- TEST I	9,00	4,06	8,31	2,89	0,69	0,49
POST- TEST II	11,30	5,06	10,69	4,01	0,61	0,33

3.3.7.5 Hypothesis Five

Primary school aged children with spelling difficulties and high socioeconomic status benefit significantly more than those from low socioeconomic families.

Out of 39 subjects, 26 were identified whose pretest-ing scores were relatively lower. On the basis of socioeconomic background scores the twenty six subjects were divided into two groups (split at median): high and low. The mean posttest scores for the two groups are given in Table 3.5. The comparisons of mean scores by means of t values indicate that socio-

economic background is not associated with English spelling achievement.

CHAPTER FOUR

4. MAIN STUDY

The main study was designed along the pattern of the pilot study. As already stated in the pilot study, the instruments used included: the University of Cape Town Test of Spelling abilities devised by Grover (1986); socioeconomic background questionnaire devised by Maqsud (1993). The investigator gave English spelling lessons to the two experimental groups. The results of the pilot study led to the conclusion that remedial treatment can improve the spelling ability of primary school children. The researcher felt the need to confirm the relationship between remediation and English spelling achievement.

Since instruction was done once a week in the pilot study, it was assumed that with an increase in remediation sessions, the effect of remediation on English spelling achievement would show a significant improvement. The sample used in the pilot study was lesser representative of the primary school children in the area where the pilot study was carried out as only one school was used and only 39 pupils took part in the experiment. In the main study, subjects were drawn from two schools located in the area where the present

study was done. The number of subjects was increased to 51 whilst remediation treatment was given twice a week to each experimental group.

4.1 *Aim of Research*

The results of the pilot study indicated a significant relationship between remediation and English spelling achievement. The researcher intended to confirm this relationship by increasing the subjects as well as remedial sessions for the main study.

4.2 *Population*



There are only two primary schools in Welbedacht area of Lehurutshe. All the Standard 4 children in both schools comprised two hundred pupils which constituted the population of the study. It was assumed that the academic standards as found in the two schools would represent a general picture of the norms pertaining to Lehurutshe area in the North West province of South Africa.

4.3 *Subjects*

Two hundred and six Standard four pupils studying at the above two Primary schools were selected for this study. Their ages ranged between 11 and 17 years.

The spelling test used in the pilot study was administered to all 206 pupils. Those whose scores were on the lower side were assumed to have some spelling difficulties. These subjects were then randomly distributed into three groups: Experimental 1, Experimental 2 and Control.

4.4 Variables studied, instruments and procedures

The variables studied, instruments and procedure followed in the main study were more or less the same as used in the pilot study.

4.5 Analysis of Data

Raw scores for pre- and posttesting for the three groups as well as their socioeconomic background scores are given in Appendix C. These data were analyzed to test the five hypotheses of the study:

In the main study, Group A received treatment of remediation for 60 minutes twice a week and Group B for 30 minutes twice a week for a period of eight weeks. It must be mentioned here that this period of treatment was interrupted by political uprisings in the area from where the subjects were taken. There was an interval of almost a month between Posttest I and further treatment of remediation in preparation

for Posttest II.

Table 4.1 gives the mean gain scores on Posttest I together with standard deviations and t values for the three groups whilst Table 4.2 shows mean gain scores on Posttest II.

TABLE 4.1

Posttest I: Mean gain scores, standard deviations and t values

GROUP	N	MEAN	SD	MEAN DIFF	t
A	17	4,06	3,23	-4,06	-1,67
B	17	8,12	7,52		
A	17	4,06	3,23	0,71	+0,63
C	17	3,35	3,26		
B	17	8,12	7,52	5,01	*2,45
C	17	3,11	3,52		

*p <0,05

The analysis of data in the above table revealed that remediation has positive effects on the spelling achievement of standard four children. However, this effect appeared significant only when the mean gain score of Group B was compared to that of Group C ($t = 2,45$; $p < 0,05$).

TABLE 4.2

Posttest II: Mean gain scores, standard deviations and t values.

GROUP	N	MEAN	SD	MEAN DIFF	t
A	17	7,47	5,21	-0,65	-0,39
B	17	8,12	4,18		
A	17	7,47	5,12	7,42	*5,48
C	17	-0,05	2,55		
B	17	8,12	4,18	8,07	*7,02
C	17	0,05	2,55		

* p <0,05

* p <0,01

The mean gain scores on Posttest II did not show a significant difference between spelling achievement of Group A and that of Group B. However, the mean gain scores of both Groups A and B were found significantly higher than that for Group C (Control). These results confirm the point that remediation has positive influences on the spelling achievement of the subjects who received the remediation treatment. However, the variable of amount of remediation did not distinctively come out as a forceful factor.

In this study, 51 primary school aged children were pretested. The pretest spelling scores of 31 boys and

20 girls were analyzed. Mean scores, standard deviations together with t values are given in Table 4.3.

TABLE 4.3

Mean scores, standard deviation and t values

GROUP	N	MEAN	SD	MEAN DIFF	t
BOYS	31	22,13	5,26	-1,27	-0,83
GIRLS	20	23,40	5,45		

From the data given in Table 4.3, it was found that the mean score of boys was not significantly higher than that of girls.

Hypothesis four (Table 4.4) intended to examine the existence of gender differences in reacting to remediation. Group A and Group B were given two posttests and the mean gain English spelling scores were analyzed to test this hypothesis.

The mean gain scores of boys were not seen significantly higher than those of girls.

On the basis of their socioeconomic background scores, 34 subjects were divided into two groups: high and low. Table 4.5 contains the mean gain scores together

with standard deviations on the Posttest I and II for the two groups. The mean scores were compared by using a t-test.

TABLE 4.4

Mean gain scores, standard deviation and t values

GROUP	SEX	N	MEAN	SD	MEAN DIFF	t
A	B	8	6,38	5,76	-2,06	-0,81
	G	9	8,44	4,80		
B	B	11	8,09	3,27	-0,08	-0,03
	G	6	8,17	5,88		

* p <0,05

* p <0,01

TABLE 4.5

Mean gain scores, standard deviations and t values.

	HIGH (N=17)		LOW (N=17)		MEAN DIFF	t
	$\bar{x}$	SD	$\bar{x}$	SD		
POST- TEST I	5,29	5,05	6,53	7,58	-2,29	-0,56
POST- TEST II	8,24	4,23	7,47	4,96	0,77	0,48

The two t values shown in Table 4.5 did not indicate any significant association between socioeconomic background and effect of remediation to improve spelling ability.

4.6 *Discussion of Results*

4.6.1 *Effects of remediation on spelling achievement of standard four children.*

The data of this investigation indicated that mean gain scores in English spelling for both Groups A and B tended to be higher than those of the control group. These data are in support of the findings reported by Sampson (1975) and Ross (1976); both researchers found that remedial treatment can improve the spelling ability of school children.

It should be noted that Group A gained less when compared to Group B in the first posttest. This might be attributed to the assumption that the subjects in Group A might have had a feeling of no trust in the researcher in the beginning of the treatment, but with the passage of time they built some kind of confidence in the researcher. The drop in the mean gain scores on the Posttest II for Group B could be due to forgetting in learning since the limited time was available to Group B for revision. To this regard, Lerner (1989:184) pointed out that children with learning difficulties tend to perform poorly on the tests of memory.

4.6.2 *Amount of remediation and improvement in spelling achievement.*

Generally, remediation was found a significant variable in the pilot study, but the results of the main study did not confirm that a greater amount of remediation could cause significant differences. Several studies (Johnson and Myklebust 1969: 310, 311; Balow as cited by Silberg and Silberg 1969:210; Montgomery 1990:178) were conducted, and these reported that remediation over a period of time, for instance a minimum of six months, resulted in short term positive effects. Gresse (1990) noted that remedial drills become effective when practised regularly.

Montgomery (1990) reported that specialist remedial tuition on two or three occasions per week proved significantly effective. Contrary to the findings of above studies, the results of the main study reported here did not show significant differences between the group that received more remedial treatment and the one that received less remediation. One important point should be noted here that for the main study there was an interruption of almost a month and a half between Posttest I and preparations for Posttest II as a result of political uprisings in the area where the present study was conducted.

4.6.3 Gender difference in English spelling ability and reaction to remediation

The data of this investigation showed no significant differences amongst sexes in English spelling scores of standard four children. Cruickshank (1977:22-25) points out that although there are more boys than girls who are counted in schools as learning disabled children, boys were expected to perform statistically significantly lower than girls in spelling tests. But Jorm (1980:11) reported that males are seen much more than females which suggests that boys might be more retarded than girls. Durrant (1994:27) concurred with these authors and he stated that the literature regarding gender differences in the incidence of learning difficulties indicates that male to female ratio is approximately 4 to 1. Findings in this investigation were in line with the idea presented by Woolfolk (1987:45) who argued that the overall IQ scores of males and females are not significantly different on the average.

4.6.4 The association between socioeconomic background and English spelling ability.

It was hypothesized that there is a significant positive relationship between the measures of socioeconomic background and spelling achievement of primary school children as the findings of the studies conducted in Western cultures established this type of relationship between the two variables. But the data

of this small scale investigation did not favour the researcher's hypothesis. This researcher quantified the information provided by the subjects as to their parents' education, occupation and economic facilities. Some recent psychologists (Woolfolk, 1987) suggested that at home it is the attitude of parents which matters more than educational and occupational levels. Woolfolk (1987:126) maintains that parents of high and middle class status tend to hold positive attitudes toward schooling, which they pass on to their children. The variable of attitude of parents would stimulate children to make efforts in order to excel in academic tasks.

CHAPTER FIVE

5. SUMMARY AND CONCLUSIONS

5.1 *Main objective of the study*

This study was intended to explore relationships between remediation and spelling ability of primary school children. In addition, it aimed at examining gender variations in spelling achievement and reaction to remediation. The variable of socioeconomic status was also included to see its effects on spelling ability of primary school children.

2. *Review of Literature*

Literature related to the role of remediation, amount of remediation, gender differences and socioeconomic status generally showed that these four variables are significantly related to spelling achievement of primary school children. The literature also denoted that the degrees of the association of the socioeconomic status and gender to remediation differed for various studies.

5.3 *Methods of Research*

5.3.1 *Subjects*

A sample of ninety standard 4 pupils was drawn from two schools in the Welbedacht area of the Lehurutshe district. The student population of these two schools differed vastly from each other in terms of amenities and equipment as well as in terms of socioeconomic backgrounds of the subjects' parents.

5.3.2 *Instruments*

In order to take the measures of spelling ability of standard four children, the University of Cape Town Spelling Test was selected as it was found a suitable instrument for the subjects of this study. With regard to the estimates of socioeconomic status a brief questionnaire to collect information as to the subjects' parental, occupational and educational background was employed; the information was quantified by using the appropriate scales.



5.3.3 *Analysis of Data*

For both the pilot study and the main study, there were two experimental groups and one control group. The effects of two remedial treatments were determined by making comparisons between the groups. The t-test was used to compare the means of the groups.

5.4 *Results*

The data for this small scale investigation revealed that:

- (i) remedial treatment generally improves spelling achievement of primary school children;
- (ii) prolonged and frequent remedial treatments do not necessarily enhance significantly more spelling achievement than short and less frequent remedial treatments;
- (iii) there are no significant gender differences in spelling achievement and in reacting to remedial treatments; and
- (iv) the variable of socioeconomic status does not significantly associate with spelling achievement of primary school children.

5.5 *Limitations*

During the course of this investigation, the researcher felt that the following limitations may be present in the study.

The interruption between the first four weeks of

tuition and the second four weeks was too long and beyond the subjects' and researcher's control. The absence of such an interval might have rendered the experiment and results more supportive of the findings of past studies.

The Socioeconomic Background Questionnaire did not involve the parents and in the Batswana culture there is no close relationship and open communication between parents and children. The responses of the subjects might not be a true picture of reality and this impedes exact information that might confirm the researcher's hypotheses.

5.6 *Recommendations*

This investigation did not reveal conclusive outcomes as to the assumptions tested. However, it did not yield data to reject the researcher's hypotheses. It is thus recommended that these assumptions should be re-investigated with the use of some diagnostic instruments which had been commonly used for remedial education.

Seeing that the study was done with subjects taken only from Welbedacht area of the Lehurutshe District in the North West province, it is recommended that the study should be repeated and it should include sub-

jects from all the regions of the North West in both rural and urban areas.

The period of eight weeks for remedial treatment might not be enough to bring about significant improvement in spelling ability. Researchers in remedial education suggest a minimum period of six months in order to see a significant improvement as a result of remedial treatment.

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APPENDIX A
MEASURING INSTRUMENTS

SCALES

NAME: AGE - YRS:.....
STANDARD: SEX:.....
SCHOOL:.....

APPENDIX A

SECTION A

UNIVERSITY OF CAPE TOWN SPELLING TEST (UCT)

INSTRUCTION:

Say: "This is a spelling test. Listen carefully and write each word next to its number. The first words are easier than those that follow. Do your best and do as many right as you can. The first word is 'a' on your paper next to number one (show where). Next to number two write 'it'. Now write 'cat'."

Each word has to be pronounced separately. The enunciation should be quite distinct and moderately slow, without dislocation of the syllables. The words may be repeated if necessary, but they are not to be enshrined in an illustrative context. There is no time limit.

Begin with the first word, and read each word in succession until the subject breaks down completely. The examiner stops dictating when he sees that the three best pupils in class have misspelled ten successive words.

Scoring: the number of correct spellings.

Alternative homophones are accepted and so are reversals of letters.

SPELLING LIST

- | | |
|-----------|---------------|
| 1. a | 26. coming |
| 2. it | 27. sorry |
| 3. cat | 28. done |
| 4. to | 29. lesson |
| 5. and | 30. smoke |
| 6. the | 31. money |
| 7. on | 32. sugar |
| 8. up | 33. number |
| 9. if | 34. ticket |
| 10. box | 35. bright |
| 11. run | 36. speak |
| 12. bad | 37. yellow |
| 13. but | 38. doctor |
| 14. this | 39. sometimes |
| 15. will | 40. already |
| 16. pin | 41. rough |
| 17. cap | 42. raise |
| 18. men | 43. scrape |
| 19. got | 44. manner |
| 20. today | 45. publish |
| 21. table | 46. touch |
| 22. even | 47. feel |
| 23. fill | 48. answer |
| 24. black | 49. several |
| 25. only | 50. towel |

APPENDIX B
SOCIOECONOMIC BACKGROUND
SCORING

SECTION B

SOCIOECONOMIC BACKGROUND QUESTIONNAIRE

1. Indicate your father's education by placing an "X" in the appropriate block.

Did not attend school	
Attended Primary school	
Attended Secondary/High school	
Attended College	
Attended University	

2. Indicate your mother's education by placing an "X" in the appropriate block.

Did not attend school	
Attended Primary school	
Attended Secondary/High school	
Attended College	
Attended University	

3. What is your father's occupation?

.....

4. What is your mother's occupation?

.....

5. Does your family own a car? Yes No

6. Does your family own a TV set? Yes No

7. Does your family own a video
cassette recorder? Yes No

8. Does the house you live in have a
garage? Yes No

9. Do your parents own their house? Yes No

APPENDIX B

SOCIOECONOMIC BACKGROUND SCORING

QUESTION NO.	RESPONSE	SCORING
1.	Did not attend school	1
	Attended Primary school	2
	Attended Secondary school	3
	Attended College	4
	Attended University	5
2.	Did not attend school	1
	Attended Primary school	2
	Attended Secondary school	3
	Attended College	4
	Attended University	5
3.	Labourer	1
	Cleaner/Messenger	2
	Semi-skilled worker	3
	Skilled worker/	
	Junior professional	4
	Intermediate professional	5
	Super professional	6
4.	Scored as for father above.	
5.	Yes	1
	No	0
6.	Yes	1
	No	0
7.	Yes	1

	No	0
8.	Yes	1
	No	0
9.	Yes	1
	No	0

APPENDIX C

RAW SCORES

APPENDIX C

PILOT STUDY EXPERIMENTAL GROUP A

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	S.E.S.	SEX
1.	11	18	7	34	16	11	MALE
2.	11	25	14	31	6	12	MALE
3.	10	21	11	33	12	14	MALE
4.	10	17	7	28	11	14	MALE
5.	12	23	11	38	25	10	FEMALE
6.	12	17	5	37	20	14	FEMALE
7.	12	20	8	28	8	9	FEMALE
8.	11	18	7	36	18	22	FEMALE
9.	10	19	9	34	15	22	FEMALE
10.	10	16	6	29	13	13	FEMALE
11.	8	21	13	27	6	16	FEMALE
12.	8	24	16	32	8	25	FEMALE
13.	7	17	10	29	12	18	FEMALE

EXPERIMENTAL GROUP B

PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	S.E.S.	SEX
9	25	16	25	0	18	MALE
9	13	4	22	9	11	MALE
7	15	8	24	9	11	MALE
6	16	10	26	10	14	MALE
4	10	6	26	10	21	MALE
0	4	4	13	9	14	MALE
7	16	9	19	3	12	FEMALE
5	15	10	27	12	6	FEMALE
3	16	13	24	8	13	FEMALE
2	9	7	23	14	10	FEMALE
10	13	3	29	16	15	FEMALE
10	16	6	25	9	12	FEMALE
10	15	5	32	17	10	FEMALE

CONTROL GROUP

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	SEX
1.	14	18	4	20	2	MALE
2.	14	12	-2	18	6	MALE
3.	14	19	5	21	2	MALE
4.	13	18	5	20	2	MALE
5.	13	19	6	23	4	MALE
6.	13	16	3	22	6	MALE
7.	13	20	7	22	2	MALE
8.	13	13	0	16	3	FEMALE
9.	13	19	6	21	2	FEMALE
10.	13	20	7	24	4	FEMALE
11.	13	19	6	22	3	FEMALE
12.	12	18	6	20	2	FEMALE
13.	12	20	8	23	3	FEMALE

MAIN STUDY

EXPERIMENTAL GROUP A

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	S.E.S.	SEX
1.	27	30	3	40	10	12	MALE
2.	26	32	6	38	6	24	MALE
3.	29	41	12	40	-1	18	MALE
4.	28	29	1	45	16	13	MALE
5.	26	33	7	42	9	19	MALE
6.	28	27	-1	28	1	16	MALE
7.	30	32	2	41	9	11	MALE
8.	32	39	7	40	1	14	MALE
9.	30	29	-1	38	9	20	FEMALE
10.	28	33	5	38	5	11	FEMALE
11.	29	32	3	45	13	19	FEMALE
12.	28	32	4	38	6	10	FEMALE
13.	31	30	1	41	11	16	FEMALE

EXPERIMENTAL GROUP A CONTINUED

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	S.E.S.	SEX
14.	29	33	4	33	0	13	FEMALE
15.	25	31	6	43	12	14	FEMALE
16.	25	30	5	45	15	14	FEMALE
17.	25	30	5	35	5	16	FEMALE

NWU
LIBRARY

EXPERIMENTAL GROUP B

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	S.E.S.	SEX
1.	25	22	-3	25	3	19	MALE
2.	23	26	3	36	10	16	MALE
3.	24	26	2	32	6	21	MALE
4.	25	36	11	43	7	16	MALE
5.	16	16	0	28	12	12	MALE
6.	19	32	13	36	4	6	MALE
7.	21	32	11	42	10	9	MALE
8.	17	25	8	37	12	18	MALE
9.	16	20	4	26	6	10	MALE
10.	11	28	17	35	7	18	MALE
11.	18	19	1	31	12	7	MALE
12.	21	30	9	42	12	21	FEMALE
13.	9	39	30	42	3	14	FEMALE

EXPERIMENTAL GROUP B CONTINUED

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	S.E.S.	SEX
14.	20	24	4	39	15	21	FEMALE
15.	24	29	5	42	13	17	FEMALE
16.	25	24	-1	25	1	10	FEMALE
17.	19	35	16	40	5	9	FEMALE

CONTROL GROUP

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	SEX
1.	23	31	8	27	-4	MALE
2.	17	15	2	14	-1	MALE
3.	12	23	11	16	-7	MALE
4.	21	20	-1	19	-1	MALE
5.	21	21	0	24	3	MALE
6.	24	24	0	26	2	MALE
7.	24	29	5	31	2	MALE
8.	24	31	7	30	-1	MALE
9.	22	19	-3	20	1	MALE
10.	23	26	3	28	2	MALE
11.	21	25	4	24	-1	MALE
12.	13	13	0	13	0	MALE
13.	21	21	0	19	-2	FEMALE

CONTROL GROUP CONTINUED

S.NO.	PRETEST	POST- TEST I	GAINS	POST- TEST II	GAINS	SEX
14.	20	23	3	22	-1	FEMALE
15.	23	26	3	28	2	FEMALE
16.	19	21	2	19	-2	FEMALE
17.	15	18	3	17	-1	FEMALE
18.	13	13	0	13	0	FEMALE